

Richards, Dale E

De: Mabrouk, Gehan
Envoyé: May-07-08 8:13 AM
À: Richards, Dale E
Objet: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Dale

On behalf of the aquaculture group ,Myself , Dr. Reid and Dr. Hamoutene have looked at the report and we came to a consensus. As indicated in the report, there are no aquaculture activities presently in that area. There may be some future possibilities of Arctic Char or wolf fish culture, but likely very limited. There have been a few small scale hatcheries of Arctic Char established recently in some Northern First Nations Communities (might be Quebec). One of the promises of wolf fish is their low temperature tolerance, so that might be a good candidate. However, we expect it may be a while before we see any of these in cages (as oppose to hatchery rearing for stocking) off the coast of Labrador anytime soon. Even if this does occur we expect the scale would be very small. Open Ocean Aquaculture may also be a long way off in that area as well, since you still need easy access to an established fish feed distribution net work for such a large operation to be viable.

I hope this is helpful. Have a great day!!!

Gehan

From: Richards, Dale E
Sent: Tuesday, May 06, 2008 3:42 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Good afternoon,

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Thanks,
Dale

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and allows for incorporation of environmental considerations at the earliest stages of program planning. The draft SEA report was prepared on behalf of the Canada-NewfoundlandOffshore Petroleum Board (C-NLOPB) by Sikumiut Environmental Ltd. The development of the report also involved a multi-stakeholder working group co-chaired by the C-NLOPB and the Nunatsiavut Government, with representatives from federal and provincial departments and agencies, One Ocean, the FFAW and the Southeastern Aurora Development Cooperation. Jim Meade, OHMB is a member of the Labrador SEA working group.

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Please distribute this message further within your respective sectors. To assist with the timely review of this SEA, I have copied this message to individual researchers and/or Section Heads that have already been identified to review certain sections of the SEA report: Section 3 - Physical Environment (ESD), Section 4 - Biological Environment (AR) and Section 5 - Effects on the Assessment Area (AR and ESD).

Thank you,
Dale

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Richards, Dale E

De: Morgan, Joanne
Envoyé: May-13-08 9:39 AM
À: Richards, Dale E
Cc: Power, Don
Objet: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale here are some comments on the above referenced SEA

4.2.1 COSEWIC Species Atlantic cod

The northern cod stock does not extend from 2G to 3L but rather that area encompasses two stocks 2GH and northern cod (2J3KL).

'The extent of migration between the inshore and offshore stocks of 2J3KL is not well understood'. This should probably be the 'current extent'.

'Tagging experiments have shown that the Northern cod stock is relatively isolated from adjacent stocks in divisions 2J3KL, 4TVn, and 3Ps.'

Since 2J3KL is the northern cod stock I don't understand this statement. If this is referring to the cod stock in 2GH then it should be called

2GH. More recent tagging by Bratney (many CSAS documents) has shown the at least the inshore portion of northern cod area has regular migrations from 3Ps.

'Despite its commercial and ecological importance, the spawning behavior of Atlantic cod is poorly understood. Spawning has rarely been observed

in the field. Recent studies have shown that successful reproduction involved complex behaviour between the sexes.'

In fact the spawning behaviour of cod was well described by Brawn in the 1960's.

4.4 Fish

Scallops, crabs, shrimp, whelks are not fish.

4.4.5 American plaice

'Females do not reach sexual maturing until they are 11 years of age (40 to 45 cm).'

Current age at sexual maturity for females in the area (2+3K) is around 8 years with a length of maturity of about 30 cm. Busby et al CSAS 2007

4.4.6 Greenland halibut

The references on spawning are out of date and more up to date sources should be used which show that spawning areas are not as clearly defined as suggested in the text.

4.9 Commercial fisheries

4.9.2 Historical overview

Fig. 4.3.1 4.3.2 and table 4.9 do not seem to match. fig. 4.3.1 seems to indicate a total of about 100000 t of catch in the last few years (foreign + domestic) while fig 4.3.2 indicates less than 60000 t. Table 4.9 gives 135000 t for the domestic harvest alone.

Also the foreign catch in recent years seems very high. Is this Irminger sea redfish (I think it could only be part of it)? If it is should it be

included? I can't really tell from the figures but it looks like the extent of the area is Canada's 200 mile limit. If it is then fish taken outside

the limit should not be included and Irminger Sea redfish would be included in that category. The authors should be sure of their numbers before

releasing a document that indicates 40 000 t of foreign catch in 2GHJ in recent years.

The labels on the axes of the graphs need to be legible.

4.9.3.1 Atlantic cod

Given that the area of interest is the offshore I don't see the utility of including a lot of inshore information, especially from the central inshore portion of the northern cod area which is not only inshore but south of the area of interest.

There seems to have been little attempt to find information on cod in 2GH. More information on this stock needs to be included. A good recent source is Smedbol et al 2002 CSAS 2002/82.

4.9.3.7 Greenland halibut

'Eventually, the fishery moved further offshore to the continental slopes (Brodie et al. 2007).' This should probably be 'continental slopes'.

'Although a TAC (Figure 4.76) is established for this resource, estimated catches have been exceeded by 27 percent, 22 percent and 27 percent respectively for the first three years of the rebuilding plan (Healey et al. 2007).' Should be 'estimated catches have exceeded the TAC by..'

'The temporal coverage of Divisions 2GH has been irregular, with no surveys being conducted in 2G since 1999 (Healey 2007).' Should be the 'temporal coverage of research surveys'. The authors can not just lift things directly from other sources without making some adjustments if they expect people to understand the text.

5.1.2 Marine Fish

5.1.2.1 Invertebrates

Invertebrates are not fish, marine or otherwise.

5.10 Planning implications

5.10.7 Planning Implications for Fish and Fisheries

I am not sure that all of the spawning times given in table 5.7 (referenced as 5.6 in the text) are correct. Especially for Greenland halibut.

More recent literature should be examined for spawning times of this species.

NOTE NEW EMAIL ADDRESS

Joanne.Morgan@dfo-mpo.gc.ca

Joanne Morgan

Research Scientist

Groundfish Section

Science Branch

Dept. of Fisheries and Oceans

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St. John's, NL, A1C 5X1

Canada

From: Power, Don
Sent: Friday, May 09, 2008 3:43 PM
To: Bratley, John; Cadigan, Noel; Dwyer, Karen; Healey, Brian; Maddock Parsons, Dawn; Morgan, Joanne; Murphy, Eugene
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Folks,

Dale sent me a reminder recently for a review of an Environmental Assessment of the Labrador Shelf. I'd completely forgotten about this and so ask for forgiveness as I submit this rather large document (553 pages) for comments/review.

Because it is so large (~14Mb) I put a copy of this on the GF Assess Server under a folder called Environmental Assessments.

The sections pertaining to fish are contained in Section 4 and there is information some species (cod, plaice, redfish, grenadier) in the biology section and the fisheries section of this report. If you have the time to look at it GREAT and I presume to send your comments directly to Dale. If you aren't able to review it by COB Tuesday, give me a time frame on when you can review it and I will seek an extension from Dale with regrets and my apology.

Don

From: Richards, Dale E
Sent: Friday, May 09, 2008 9:52 AM
To: Power, Don
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Don,

Nope, given the new service delivery methods of IMTS I am still awaiting action on the server request. I will drop by later this morning with a copy of the SEA on disc for you. Let me know if you require additional copies for others within the groundfish Section.

Dale

From: Power, Don
Sent: Thursday, May 08, 2008 11:52 AM
To: Richards, Dale E
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale,
Is this report on a server?
Don

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Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
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Thank you,
Dale

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Richards, Dale E

De: Tillman, Joe
Envoyé: May-14-08 9:15 AM
À: Richards, Dale E
Objet: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

J.M. Tillman
Director, Program Services and Planning
Science Branch
NL Region
Ph.: (709) 772-4355
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e-mail: Joe.Tillman@dfo-mpo.gc.ca

From: Anderson, M. Robin
Sent: Tuesday, May 13, 2008 3:08 PM
To: Tillman, Joe
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Joe,
Here is my review. I would appreciate if you can pass it on to Dale. It is due today and I know her turn around time is tight.
Thanks,
Robin

Please note new email address below

M. Robin Anderson, PhD
Marine Habitat Research Scientist
Environmental Science Division
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80 East White Hills Road
PO Box 5667
St. John's, NL A1C 5X1
CANADA
Tel: 709-772-0460
Fax: 709-772-5315
Email: M.Robin.Anderson@dfo-mpo.gc.ca

From: Anderson, M. Robin
Sent: May 13, 2008 12:24 PM
To: Richards, Dale E
Cc: Davis, Ben
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Dale,

Please find attached my review of the Draft SEA for the Labrador Shelf Area. This document is **not acceptable** in its current state. Much of the literature on the biology and ecology of the region is ignored as are several important issues such as climate change and sea ice as habitat. I have detailed these and other concerns in my comments. If you have any questions or would like mere input please do not hesitate to ask.

Robin



**Review of the
Labrador Shelf S...**

Please note new email address below

M. Robin Anderson, PhD
Marine Habitat Research Scientist
Environmental Science Division
Science Branch
Fisheries and Oceans Canada
80 East White Hills Road
PO Box 5667
St. John's, NL A1C 5X1
CANADA
Tel: 709-772-0460
Fax: 709-772-5315
Email: M.Robin.Anderson@dfo-mpo.gc.ca

From: Richards, Dale E
Sent: May 6, 2008 3:42 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Wilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
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Review of the “Draft Two Report: Strategic Environmental Assessment Labrador Shelf Offshore Area”.

By: M. Robin Anderson

May 13th, 2008

As requested, I have reviewed the document entitled “Draft Two Report: Strategic Environmental Assessment Labrador Shelf Offshore Area”. I have a number of general comments followed by specific or detailed concerns.

General comments:

The document is deficient in the description of the existing biological environment. In particular Section 4.3 which should contain the general biological framework of the ecosystem is lacking in rigor and in documentation. It is **not acceptable** in its current format.

The description of the lower foodweb demonstrates a clear lack of understanding of the fundamental processes and ecological dynamics supporting primary and secondary production on the Labrador Shelf. The sections on plankton are very poor and deficient. The microbial web is omitted completely. Contributions to primary production by ice algae, macroalgae and seagrasses are also ignored.

- s.19(1) In numerous places the authors note that information is lacking about the biology and ecology and of the Labrador Shelf Area. While much remains to be learned, there is a long history of biological studies in the region little of which is referenced in this document. It is clear that the authors [REDACTED] have omitted reference to most of the relevant literature. Much of this literature was reviewed in the “Offshore Labrador Initial Environmental Assessment” (Petro Canada 1982) and in the detailed studies of the OLABS program. It should be a simple matter to update the material since that time.
- s.21(1)(b)

Assessment of the risks associated with exploration for and production of oil and gas in the Labrador Shelf Area are based on the assumption that accident and spill data from temperate regions around the world adequately reflect the level of risk of such developments on the Labrador Shelf. While the regulatory regime and the technologies may be similar this is not the case for the environmental conditions. The most appropriate comparison groups would be from the Grand Banks or regions like the Beaufort Sea or Sakhalin Island where ice conditions and severe weather might be assumed to be similar as a first basis for comparison. The importance of failing to meet this basic assumption in selection of a comparison group is clear when the oil spill statistics for the Grand Banks are compared with those from the US OSC or the North Sea used to calculate the associated risks. According to the data presented in section 2.6.5 spills are orders of magnitude more frequent on the Grand Banks than elsewhere. This is a concern. Arctic environmental conditions should be taken into consideration in these calculations. [REDACTED]

Ice as a habitat is not mentioned in the document. The ice algae community is not discussed and its contribution to primary production is ignored. Ice as habitat for marine mammals is similarly ignored. As a result the consequences of an oil spill in ice are not addressed in this context. The document also down plays the risk associated with an oil spill in ice. Current clean up methods are not sufficient when ice cover is > 30%. While oil spill response is highlighted as an important requirement for exploration and production in the Labrador Shelf Area the lack of adequate technology for this purpose is not addressed.

Climate change is and will continue to have major consequences for the both the environment and the ecosystem of the Labrador Shelf. The document must include a section on anticipated changes, the potential effects on exploration and production of oil and gas on the Shelf as well as the changes in risk scenarios that may result (due to changes to ice conditions or severe weather event frequency or magnitude for example). The document should also consider the cumulative effects of climate change and oil and gas related activities on the VECs selected for this assessment.

Specific concerns:

The rationale for VEC selection should be included in the document.

Water chemistry/water quality is not identified as a specific VEC but should be included as part of the description of the environment and potential effects should be discussed as part of the fish habitat VEC.

P42 2.5.3 The first sentence is incorrect. It implies that produced water is only seawater. The second sentence is correct.

Radioactivity of produced water is a significant concern for certain formations – for example, produced water is now the largest source of radioisotopes to the North Sea however there is considerable uncertainty about the exact numbers as most countries do not require reporting on discharges of radioactivity (Betti et al, 2004). Inorganic and organic nutrient enrichment from produced waters can be considerable and may have significant consequences on the marine foodweb (Rivkin et al. 2001). Both Radioisotopes and nutrient enrichment should be included in the discussion.

P 47 Last ¶ While the practices and technologies that will be used in the Labrador Sea area may be the same as elsewhere around the world, this is not the case for the environmental conditions. This very important assumption underlies the use of accident and risk statistics from other offshore oil producing regions. There are a number of oil producing regions subject to extreme weather conditions and ice. These should be used for risk analysis and comparison purposes.

Table 29 NRC 2002 is not referenced – is this NRC 2003?

Section 2.6 Accidental events due to severe weather are ignored in this section. Many serious accidents to rigs (<http://www.oilrigdisasters.co.uk/>) were caused by storms or other severe weather events.

P54 The calculation of blow out frequency does not make sense. Why average 4 temporally overlapping frequencies and then reduce by 50%? If blow out frequencies for older data are not relevant for today's operating conditions then they should be omitted and only data for relevant time periods used. The rationale for the time period selected (i.e regulatory and technological relevance) should be provided.

Differences between blow out frequency for exploration vs development wells should be discussed.

P66 2.6.8.2 Oil spilled within pack or drift ice. Where is the documentation to support this section? Is it just speculation or is there data available to back up these contentions?

P75 This section should include a discussion of the lack of capability to clean up spills in > 30% ice cover and the effectiveness of cleanup capabilities in ice < 30%.

P77 The proposed ice management schemes are very energy intensive. What is the cost of such an approach in terms of fuel used per volume of oil retrieved?

P100 Subsidence and bank edge slips are not considered in the section on geological hazards. Do they occur in the Labrador Shelf Area? If so where, how often and what are the potential consequences?

P130 The categories proposed for ceiling and visibility ratings do not make sense. Is this a typo?

P140 Speed of ice movement should be presented in the same units in table and text.

P152-153 The shallow draft of ice islands also allows them to drift into much shallower water than the big bergs. The areas of risk of movement and grounding on the banks of the Shelf will therefore be different for ice islands. This should be addressed in the document.

P156 How are these means calculated? Are all profiles used and if so is the number obtained weighted by the number of profiles per scour? or are there the same number of profiles for each scour? How is the standard deviation calculated? for each score or with all profiles? If the latter this is not a correct calculation since the profiles for each score are not independent samples.

P162 Tab. 3.50 Sub heading for column 6 should read "effective pit diameter".

Questions about the calculation of mean and standard deviation raised above should be addressed for these calculations too.

P 189 4.3.2 Highly productive kelp beds are found scattered throughout the coastal archipelago anywhere sheltered from ice scour by irregular bathymetry. These make a significant contribution to primary production in the coastal areas of the Labrador Shelf. The sessile community have been documented qualitatively (see Petro Canada 1982) but have not been assessed quantitatively. This should be identified as a data gap.

P189 4.3.3.1 This is a very poor summary of the pelagic system of the Labrador shelf. It demonstrates a lack of understanding of the ecology of primary production. This section should be rewritten and adequately documented. Much of the existing literature is ignored.

Bacteria, ice algae and microzooplankton are ignored as is the role of heterotrophic production. The contribution of aquatic macrophytes and freshwater inputs of organic matter to primary production of the Shelf is ignored. There is no discussion of the influence of the many rivers draining onto the shelf.

P195 4.3.3.2 This section is also very poor. Conclusions are drawn from references pertaining to areas outside the Labrador Shelf (Breeze et al = Scotian Shelf). References are incomplete (Drinkwater and Harding?)

4.3.4 Also very poor. None of the relevant literature appears to have been referenced. There are in fact quite a number of studies directly relevant to the benthos of the Labrador Shelf (for example: Gagnon and Haedrich, 1991; Barrie et al. 1980; Carey 1991; Stewart et al 1985).

4.3.5 The references provided in this section are for the Gulf of St. Lawrence.

P222 4.6.3 The seal section in the Offshore Labrador Initial Environmental Assessment (Petro Canada, 1982) is much better referenced and written than these sections.

P223 Why are maps from 1969-1987 included here without update?

P243 Fig. 4.31, 4.32 X axis labels are missing.

P 345 If OWTG (2002) are to be reviewed every 5 years then this was due last year. What is the status of the review and the guidelines?

5.2.2 What is the NL experience with drill cuttings? Why are only model results discussed? Observations of drill waste dispersion and deposition should be included in this section as well as a discussion of how well the models work.

P351 5.2.10 Why is reinjection not included as a possible mitigation?

- P352-3 Produced water: This section is missing several important items:
- impacts on primary and secondary production
 - radioisotopes
 - changes to redox chemistry upon release and consequences for availability of contaminants

P354 The density of the produced water will also depend on the salinity of the formation.

P355 Produced water discharges increase with the age of a well. The White Rose EEM report referred to is too early in the production life of the project to expect impacts from produced water.

Why is reinjection omitted from the list of possible mitigations?

P 357 Several of the spill trajectories in easterly winds overlap the moulting grounds for harlequin ducks. The consequences should be discussed.

References

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Stewart, PL; Pocklington, P; Cunjak, RA 1985. Distribution, abundance and diversity of benthic macroinvertebrates on the Canadian continental shelf and slope of southern Davis Strait and Ungava Bay. Arctic 38:281-291.

Richards, Dale E

De: Morgan, Joanne
Envoyé: May-14-08 10:17 AM
À: Richards, Dale E
Cc: Power, Don
Objet: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale here are some comments on the above referenced SEA

4.2.1 COSEWIC Species Atlantic cod

The northern cod stock does not extend from 2G to 3L but rather that area encompasses two stocks 2GH and northern cod (2J3KL).

'The extent of migration between the inshore and offshore stocks of 2J3KL is not well understood'. This should probably be the 'current extent'.

'Tagging experiments have shown that the Northern cod stock is relatively isolated from adjacent stocks in divisions 2J3KL, 4TVn, and 3Ps.'

Since 2J3KL is the northern cod stock I don't understand this statement. If this is referring to the cod stock in 2GH then it should be called

2GH. More recent tagging by Brattey (many CSAS documents) has shown the at least the inshore portion of northern cod area has regular migrations from 3Ps.

'Despite its commercial and ecological importance, the spawning behavior of Atlantic cod is poorly understood. Spawning has rarely been observed

in the field. Recent studies have shown that successful reproduction involved complex behaviour between the sexes.' In fact the spawning behaviour of cod was well described by Brawn in the 1960's.

4.4 Fish

Scallops, crabs, shrimp, whelks are not fish.

4.4.5 American plaice

'Females do not reach sexual maturing until they are 11 years of age (40 to 45 cm).'

Current age at sexual maturity for females in the area (2+3K) is around 8 years with a length of maturity of about 30 cm. Busby et al CSAS 2007

4.4.6 Greenland halibut

The references on spawning are out of date and more up to date sources should be used which show that spawning areas are not as clearly defined as suggested in the text.

4.9 Commercial fisheries

4.9.2 Historical overview

Fig. 4.3.1 4.3.2 and table 4.9 do not seem to match. fig. 4.3.1 seems to indicate a total of about 100000 t of catch in the last few years (foreign + domestic) while fig 4.3.2 indicates less than 60000 t. Table 4.9 gives 135000 t for the domestic harvest alone.

Also the foreign catch in recent years seems very high. Is this Irminger sea redfish (I think it could only be part of it)? If it is should it be

included? I can't really tell from the figures but it looks like the extent of the area is Canada's 200 mile limit. If it is then fish taken outside

the limit should not be included and Irminger Sea redfish would be included in that category. The authors should be sure of their numbers before

releasing a document that indicates 40 000 t of foreign catch in 2GHJ in recent years.

The labels on the axes of the graphs need to be legible.

4.9.3.1 Atlantic cod

Given that the area of interest is the offshore I don't see the utility of including a lot of inshore information, especially from the central inshore portion of the northern cod area which is not only inshore but south of the area of interest.

There seems to have been little attempt to find information on cod in 2GH. More information on this stock needs to be included. A good recent source is Smedbol et al 2002 CSAS 2002/82.

4.9.3.7 Greenland halibut

'Eventually, the fishery moved further offshore to the continental slopes (Brodie et al. 2007).' This should probably be 'continental slopes'.

'Although a TAC (Figure 4.76) is established for this resource, estimated catches have been exceeded by 27 percent, 22 percent and 27 percent respectively for the first three years of the rebuilding plan (Healey et al. 2007).' Should be 'estimated catches have exceeded the TAC by..'.
'Should be the

'temporal coverage of research surveys'. The authors can not just lift things directly from other sources without making some adjustments if they expect people to understand the text.

5.1.2 Marine Fish

5.1.2.1 Invertebrates

Invertebrates are not fish, marine or otherwise.

5.10 Planning implications

5.10.7 Planning Implications for Fish and Fisheries

I am not sure that all of the spawning times given in table 5.7 (referenced as 5.6 in the text) are correct. Especially for Greenland halibut.

More recent literature should be examined for spawning times of this species.

NOTE NEW EMAIL ADDRESS

Joanne.Morgan@dfo-mpo.gc.ca

Joanne Morgan

Research Scientist

Groundfish Section

Science Branch

Dept. of Fisheries and Oceans

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Canada

From: Power, Don
Sent: Friday, May 09, 2008 3:43 PM
To: Bratley, John; Cadigan, Noel; Dwyer, Karen; Healey, Brian; Maddock Parsons, Dawn; Morgan, Joanne; Murphy, Eugene
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Folks,

Dale sent me a reminder recently for a review of an Environmental Assessment of the Labrador Shelf. I'd completely forgotten about this and so ask for forgiveness as I submit this rather large document (553 pages) for comments/review.

Because it is so large (~14Mb) I put a copy of this on the GF Assess Server under a folder called Environmental Assessments.

The sections pertaining to fish are contained in Section 4 and there is information some species (cod, plaice, redfish, grenadier) in the biology section and the fisheries section of this report. If you have the time to look at it GREAT and I presume to send your comments directly to Dale. If you aren't able to review it by COB Tuesday, give me a time frame on when you can review it and I will seek an extension from Dale with regrets and my apology.

Don

From: Richards, Dale E
Sent: Friday, May 09, 2008 9:52 AM
To: Power, Don
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Don,

Nope, given the new service delivery methods of IMTS I am still awaiting action on the server request. I will drop by later this morning with a copy of the SEA on disc for you. Let me know if you require additional copies for others within the groundfish Section.

Dale

From: Power, Don
Sent: Thursday, May 08, 2008 11:52 AM
To: Richards, Dale E
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale,
Is this report on a server?
Don

From: Richards, Dale E
Sent: Tuesday, May 06, 2008 3:42 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Good afternoon,

Just a reminder that this information is requested by Tuesday of next week (May 13). If you require a copy of the SEA on disc please contact Janice.

Thanks,
Dale

From: Richards, Dale E
Sent: Thursday, April 10, 2008 3:41 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

A draft of the Strategic Environmental Assessment (SEA) Labrador Shelf Offshore Area has been received from OHMB for review by Science. Comments on this report are requested to be submitted to the CSA Office by **Tuesday, May 13, 2008**. The CSA office will consolidate the Branch response to OHMB.

Strategic Environmental Assessment (SEA) is a systematic and comprehensive process of evaluating the environmental effects of a policy, plan or program and its alternatives. SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which may be associated with a plan, program or policy proposal and allows for incorporation of environmental considerations at the earliest stages of program planning. The draft SEA report was prepared on behalf of the Canada-NewfoundlandOffshore Petroleum Board (C-NLOPB) by Sikumiut Environmental Ltd. The development of the report also involved a multi-stakeholder working group co-chaired by the C-NLOPB and the Nunatsiavut Government, with representatives from federal and provincial departments and agencies, One Ocean, the FFAW and the Southeastern Aurora Development Cooperation. Jim Meade, OHMB is a member of the Labrador SEA working group.

The information from the SEA will assist the C-NLOPB in determining whether exploration rights should be offered in whole or in part within the Labrador Shelf area and may identify general restrictive or mitigative measures that should be considered when conducting exploration activities. Activities associated with exploration licenses may include: conducting seismic surveys, other geophysical surveys, geotechnical and surveys; drilling of wells (either exploration or delineation); and well abandonment. If one or more exploratory drilling programs successfully identify petroleum deposits with commercial potential, production activities may follow. Production activities may involve: drilling of wells (delineation, development/production, and injection wells); installation and operation of sub sea equipment; installation and operation of production facilities; and production abandonment activities.

Given the size of the SEA report (13.6 MB), we are in the process of setting up an internal Science drive/directory where the complete SEA can be viewed or downloaded. However, in the interim complete electronic versions of the report (on disc) or hardcopy sections of the report will be made available by contacting the CSA Office (Dale) and/or Janice Lannon.

Please distribute this message further within your respective sectors. To assist with the timely review of this SEA, I have copied this message to individual researchers and/or Section Heads that have already been identified to review certain sections of the SEA report: Section 3 - Physical Environment (ESD), Section 4 - Biological Environment (AR) and Section 5 - Effects on the Assessment Area (AR and ESD).

Thank you,
Dale

*Dale Richards
Coordinator, Centre for Science Advice (CSA)
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Richards, Dale E

De: Stenson, Garry
Envoyé: May-14-08 3:24 PM
À: Richards, Dale E
Objet: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale



Lab SEA review



Labrador SEA

I was hoping to go through this before sending it on but here it is

PLEASE NOTE NEW EMAIL ADDRESS and FAX NUMBER

Garry B. Stenson
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From: Richards, Dale E
Sent: May 14, 2008 2:10 PM
To: Stenson, Garry
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Garry,

I was speaking with Becky this morning regarding the Labrador Shelf SEA review. Would you be able to send along the comments from your section? If you require addition time, please advise and I'll see what I can work out with OHMB?

Thanks,
Dale

From: Richards, Dale E
Sent: Thursday, April 10, 2008 3:41 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Wilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

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The information from the SEA will assist the C-NLOPB in determining whether exploration rights should be offered in whole or in part within the Labrador Shelf area and may identify general restrictive or mitigative measures that should be considered when conducting exploration activities. Activities associated with exploration licenses may include: conducting seismic surveys, other geophysical surveys, geotechnical and surveys; drilling of wells (either exploration or delineation); and well abandonment. If one or more exploratory drilling programs successfully identify petroleum deposits with commercial potential, production activities may follow. Production activities may involve: drilling of wells (delineation, development/production, and injection wells); installation and operation of sub sea equipment; installation and operation of production facilities; and production abandonment activities.

Given the size of the SEA report (13.6 MB), we are in the process of setting up an internal Science drive/directory where the complete SEA can be viewed or downloaded. However, in the interim complete electronic versions of the report (on disc) or hardcopy sections of the report will be made available by contacting the CSA Office (Dale) and/or Janice Lannon.

Please distribute this message further within your respective sectors. To assist with the timely review of this SEA, I have copied this message to individual researchers and/or Section Heads that have already been identified to review certain sections of the SEA report: Section 3 - Physical Environment (ESD), Section 4 - Biological Environment (AR) and Section 5 - Effects on the Assessment Area (AR and ESD).

Thank you,
Dale

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Richards, Dale E

De: Lawson, Jack
Envoyé: May-09-08 5:04 PM
À: Stenson, Garry
Objet: Lab SEA review
Pièces jointes: Labrador SEA Review.doc; ATT49505.htm

Here are my comments - can't be too critical as they do not say much that is novel. Must wait for the project-specific SEAs...

The pretty much stick to dealing with the SAR-listed species.

Best regards, Jack

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Comments by Dr. J. Lawson on:

DRAFT TWO REPORT “Strategic Environmental Assessment, Labrador Shelf Offshore Area”

While this document provides a Strategic Environmental Assessment of potential exploration and production activities that could occur in the Labrador Shelf Offshore Area, I felt some issues still need to be addressed, and the authors could have gone further in suggesting mitigation and monitoring tasks.

One of my continuing complaints is the continued assertion that only SARA-listed marine mammal species be considered when determining the need and types of monitoring and mitigation processes. I think this is short-sighted on the part of the C-NLOPB as the status of quite a few marine mammal species in our waters have yet to be assessed by COSEWIC, and mitigation measures for a SARA-listed marine mammal are likely just as relevant to those that have yet to be listed.

Specific comments:

P. 28 – the statement “A study by the US Naval Research Laboratory done in 1972 showed that ambient noise levels in the sea were 87 dB... Studies of ambient noise worldwide have shown a 3 dB rise in levels per decade that would bring the levels to approximately 96 dB.” Needs to be clarified. What studies? Where was the recorded level equal to 87 dB, and in what conditions? This does not necessarily relate to levels in the Labrador SEA area in any way.

P. 31 – “A relatively strong infrasonic component approximately 1.5 Hz, corresponding to the rotation rate of the drilling turntable, was measured by Hall and Francine ... however, such low frequencies would attenuate rapidly in water shallower than a few tens of metres and are not transmitted into the water by all caisson rigs.” But how does this apply to offshore rigs in Labrador or in deep water?

P. 174 – another threat to marine mammals is displacement of the animals due to anthropogenic noise

P. 175 – it must be stated that the lack of sightings of fin (or any other marine mammal or sea turtle) in mid- and northern Labrador waters may relate as much to the lack of observer effort as it does to actual distributional differences. The map for fin whales, at least, should state this.

P. 212 – killer whales ARE sighted regularly in the northwest Atlantic. A recent summary includes a preliminary abundance estimate and descriptions of distribution that includes the project SEA. Lawson et al. 2007. Killer whales of Atlantic Canada, with particular reference to the Newfoundland and Labrador Region. DFO, Research Document 2007/062. Available at <http://www.dfo-mpo.gc.ca/csas/>

P. 362 – oil spills could also indirectly effect the health of marine mammals through ingestion, ingestion of contaminated prey, or a by reduction in available prey through the prey’s death. For

example, this may be the cause of the decline of the Alaskan killer whale population following the Exxon Valdez oil spill.

P. 390 – As I suggested at the outset, I think that seismic airgun array shut downs should be applicable to more marine mammals than just those SARA-listed species.

P. 390 – I think the authors should include more detail on the “Marine Mammal and Seabird Observation program”. I have offered to train these observers in the past, and they can offer far better data collection and mitigation through training and a clear and detailed plan for their activities.

Richards, Dale E

De: Sjare, Becky
Envoyé: May-12-08 11:04 AM
À: Stenson, Garry
Cc: Lawson, Jack
Objet: Labrador SEA

Garry,

Here are my comments. The yellow high-lights are things you and Jack should have a look at; the blue are for Dale.

BS



**IMB_2008_Labrad
Shelf SEA_ma...**

NOTE NEW E-MAIL AND FAX

Dr. Becky Sjare

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80 East White Hills Rd.
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Labrador Shelf SEA – Comments Marine Mammal Section

Personnel from the Marine Mammal Section reviewed relevant sections of Chapter IV – The Biological Environment in detail. Various other related sections were reviewed in less detail to get an overall perspective of the document as well as to determine how comprehensive the material on marine mammals was compared to other sections of the document.

General Comments:

-The Introductory Chapter outlines the scoping process that was conducted for this SEA. It appears to have been fairly extensive. As has been mentioned with previous SEA documents, it would be beneficial from everyone's perspective if Science Branch researchers were involved in this process at an early stage. Several of the following key short-falls could have been dealt with and the result would have been a much more useful and informative document.

-There are three main weaknesses in this document that should be addressed by the inclusion of new text and better linkages between existing sections of text.

1) In Chapter 4 there appears to be no mention of the large scale ecosystem changes that have occurred in the NW Atlantic since the mid-1980s. It is not possible for a SEA document with the said objectives to not include and acknowledge these large scale changes. Even in the commercial fish section the graphics clearly show how the industry has radically changed and yet there is no ecological framework provided. These large scale changes should be appropriately indicated for all the species that are discussed – particularly the one that are considered 'keystone' such as capelin and Arctic cod (which is not even included in the document). This concern has been raised in at least one previous SEA document and there seems to have little movement to address this problem. It should be addressed in this document.

2) There is also no acknowledgement or recognition of the importance of climate variability and climate change. Some of the pertinent information for this topic will be covered off and integrated with the presentation of data on large scale ecosystem change; however, there should be a section on future climate projections for eastern Canada. There are regional models becoming available that provide our first 'look' forward at what conditions are going to be like over the next 25 to 50 years. This is relevant information that should be taken into consideration throughout the text of this SEA document. Looking briefly through the commercial fish section, the sea ice section and project related effects section (e.g. oil spill section), there is no evidence this has been attempted.

3) There is little attempt (except in the sea bird section) to integrate and synthesize existing information within an ecosystem framework. It is recognized that this can't be done in all cases or for all species, but it is important that initial steps be taken since this is the direction that DFO is moving nationally – clients must recognize this. Similarly, if DFO requires that their clients adopt this approach, then we (the Department) must consistently push for compliance.

Addressing these short comings in the document would have been much easier if the need had been identified earlier. However, some key insertions of text in each section of the document (were appropriate) will be an improvement. This should be the approach taken.

- There is new abundance and distribution information becoming available for some cetacean species based on a series of large scale surveys conducted in 2007 (TNASS Project). Depending on the timeframe of availability these data, they should either be included in the document. If not available, they should at least be a statement indicating that new information will be available in the near future for these species (Contact: Jack Lawson, DFO).

- Throughout the document the scope, type and detail of information on each topic varies significantly. Some sections like sea ice, corals and aspects of underwater noise are very detailed, use original references and are current. They are well written and provide information that is specific to the region, and they are useful. However, other sections are overly brief, simplified, use very general and often older references and end up providing an inaccurate perception of the topic in question and don't reflect the ecological importance of the species or topic (e.g. some of the marine mammal species, zooplankton, some of the fish species). In many cases information does not exist to address species/topics in such detail. This is an important point and should be more clearly stated in the relevant sections of text. Given the objectives of a SEA document, a better balance needs to be achieved.

- In the case of marine mammal species where specific SEA regional data (and in many cases, any data at all) are lacking, general biological information from other parts of its range as well as 'global' or 'northern hemisphere' abundance information is provided. This information is important, but should not overshadow or deflect attention away from the fact we know nothing about the species in the SEA region or the fact the species may be a listed SARA species e.g. the text on the blue whale; rewording is required in cases such as this

- Much of the marine mammal species accounts are taken from COSEWIC documents that have to be somewhat general by their nature; hence some of the information does not reflect the biology, migratory behavior and social behavior of the species in Newfoundland and Labrador waters. When available, key original references and regionally specific information should be presented. Again, when there is a paucity of data it has to be more clearly noted rather than adding information that is not really relevant to the area.

- The strong focus on primarily on commercial fish species somewhat compromises the intent of a SEA given that ecologically important species are not included. This is particularly glaring with the omission of Arctic cod which is a key-stone species. Information on this species should be included. Other sections of text should be examined for similar types of content gaps which relate back to the lack of an ecosystem framework for the document.

2.3 Regional Acoustic Characteristics of Cetaceans (Table and Text):

- Cetacean species as listed are fine; however pinnipeds also communicate acoustically and can be masked by industrial noise. This is particularly the case for bearded seals and, to a lesser degree ringed seals. Cases, could also be made for hooded and harp seals at certain times of the year.

-At least bearded and ringed should be listed in the table (and generally considered/included in all subsequent sections of related text)

Figures 4.1 and 4.2 – Distribution and Density of Wolffish

-The figure captions should be checked; the word 'distribution' should probably be replaced by 'density'

4.1.2.2 Blue Whale

-As written the opening text for the section doesn't appropriately emphasize the serious situation Blue whales of the northern hemisphere are in; . . . 'blue whales are found globally'. . . . the opening paragraph should be reworded to reflect this.

-Compared to text on the fin whale, the blue whale information is less detailed and vague; general life history information is missing.

-There is a list of projected related stressors listed (e.g. ship collisions) in the last paragraph of the text; disturbance due to industry related underwater noise should also be included.

Table 4.2 – COSEWIC List of Species

-Delete western Hudson Bay from the range/population designation column (this population is not endangered) and correct its' status.

-Walruses should be added to the table since the Arctic population is listed as threatened and walruses that are observed along the Labrador coast, primarily in the pack-ice zone are from this population.

-Ensure related walrus text is inserted in text.

-Given that it is not certain that the beluga along the Labrador coast are from the eastern Hudson Bay stock, the listings of the Cumberland Sound and eastern Arctic populations should also be included in the table. (Jack, Garry do you agree?)

4.2.4 Beluga

-Check entire document for reference to the Labrador Inuit Association (LIA) – replace with Nunatsiavut Government or other related designation.

-In the sentence referring to the stock affinities of the beluga whales observed in Labrador waters - the eastern Hudson Bay population must be included in addition to the Ungava Bay population. However, it is also possible that there are whales from the Cumberland Sound population, or even Western Hudson Bay. The sentences in

question need rewording – check the most current stock status reports for beluga whales on DFO Publication web site.

4.2.6 Harbour Porpoise

-Correct the reference for harbour porpoise by-catch levels – should be Benjamin and Lawson.

-Correct 'Lance' to lance.

4.3.3.2 Zooplankton (General Comment as scanning through document)

-This section seems overly brief and general compared to the phytoplankton and is of little use as presented.

There is no mention of the Atlantic Zonal Monitoring Program in these sections – Dale: flag this and see if Pierre or someone else takes a closer.

4.4.8 Capelin

-Given the importance of this species in the SEA region, this is a very general section that needs an upgrade in references and more regional specific information. It also is a section that requires a discussion of long term changes in the resource (i.e. effects of ecosystem change and impact of future climate change).

-Some rewording is required to ensure that the reader is not left with the impression that capelin may spawn in early June in coastal Labrador – this is not correct.

4.5 Data Gaps for Fish

-This section needs to be rewritten. It is vague, convoluted and not informative compared to other Data Gap sections.

4.6.1.2 Sei Whale

-Insert reference for evidence of two stocks.

4.6.1.3 Bowheads

-The sentence '*No live bowheads for a century. . . .*' needs to be put into the proper context. There have been several sightings in Newfoundland waters in more recent years suggesting whales still occasionally use the area; these references should be inserted. There is a high likelihood that the species uses the northern areas of SEA region – this should also be reflected.

4.6.2.3 Killer Whales

-This section needs to be updated with a recent publication or pers comm. from J. Lawson. In recent years killer whales sightings are more common than the text implies.

Figure 4.25 Seal Sightings and Distribution

-This figure should be deleted because it is based on so little data and it is not representative for any of the species. Infact, it leaves the reader with an incorrect perspective of seal distribution.

-Check that there is an appropriate reference for all the marine mammal sighting maps somewhere earlier in the text.

4.6.3.1 Harbour Seals

-Readers should not get the impression that harbour seal pups don't go in the water until after the weaning period. The last two sentences of the first paragraph should be reworded.

4.6.3.1 Harp Seals

-Update population estimates and references (2004 survey information is available on DFO web site).

-Check the sentence that indicates '*Atlantic cod*' comprises 54% of the harp seal diet - it should probably be '*Arctic cod*' or there is some other mistake or missing contextual information. Regardless, the sentence is an over simplification and provides an inaccurate perception of harp seal diet given the annual, seasonal, geographic and age class variations that exist.

-Change the sentence . . . '*harp seals are expected to be common in the SEA region.* .' to '*they are common in the SEA region*'.

-It should be noted that in most years a substantial proportion of the harp seals pupping in Newfoundland and Labrador waters do so in the southern portion of the SEA region. This has implication for the impact assessment of oil spills and possibly other industry related activities.

-TEK information is minimal for this species in the text. Brice-Bennett (1977) is cited. There needs to be a detail on current subsistence use and evolving commercial use. The Nunatsiavut Government has plans to become more actively involved in encouraging increased participation the harp seal commercial hunt.

4.6.3.2 Hooded Seals

-There are new 2004 population estimates available for this population on the DFO web site.

-As in the case with harp seals, in most years a substantial proportion of the hooded seals pupping in Newfoundland and Labrador waters do so in the southern portion of the SEA region. This information should be added to the text.

4.6.3.4 Bearded Seals

-The sentence indicating. . . . 'Seasonal movements are directly related to sea ice. . . .' should be reworded. Along the Labrador coast some bearded seals remain in coastal waters during the summer and may not follow the receding ice northward. As written the above sentence is an over simplification that gives an incorrect impression of the ecology and movement patterns of the species for the SEA region.

-Including information on weights, lengths and body condition deviates from the format for the other seal species. Similar information is available for them as well. Suggest adding complimentary information for the others, or deleting it here.

-TEK information is missing.

4.6.3.5 Grey Seals

-Reword the sentence pertaining to grey seal distribution – ' . . .grey seals are present in the SEA region. . . '

4.6.3.6 Ringed Seals

-Reword and add additional information regarding this sentence – ' . . . no compelling evidence that ringed seals undertake co-ordinated seasonal migrations.' The meaning of the sentence is unclear because 'co-ordinated' is not defined. Nor is it clear what comparisons are being made. More emphasis should be placed on the variable nature of the movement patterns that have been documented: some animals don't move, other move relatively short distances (within 100-300miles) and others move several thousand miles. As written the sentence and related text does not accurately reflect the movement behavior of this species in general and it does not provide information that is more specific to the coast of Labrador.

4.6.4.1 Loggerhead Turtles

-Jack, do you want to read the turtle sections?

4.6.4 Marine Mammal and Turtle Data Gaps

-The section outlines the general areas where data gaps exist; however, it should be made clear that even for species that are relatively well studied in parts of their range – little is known about what goes on in Labrador waters. This point gets lost in the generalities.

4.10 Sensitive Areas and 4.10.9 Data Gaps for Sensitive Areas

-There are no sensitive areas for marine mammals mentioned; this is primarily because so little is known. This point needs to be reflected and emphasized in the text. There is a significant amount of evidence that indicates areas important for marine birds are also likely important for a variety of marine mammals species (and there are some sensitive sea bird areas identified in the text).

4.10.1 Regulatory Framework

-Dale: This section lists and outlines the mandates for key Acts – e.g. the Marine Mammal Act and the Fisheries Act. However, the Oceans Act and SARA are not listed here. I'm not sure if they should be or not. Check with Oceans folks.

Richards, Dale E

De: Simpson, Mark R
Envoyé: May-15-08 7:23 AM
À: Richards, Dale E
Objet: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Sorry Dale: I was out of town at a meeting - I have read ONLY the SARA sections of the SEA and have no comments.
Mark

From: Richards, Dale E
Sent: Wednesday, May 14, 2008 4:00 PM
To: Simpson, Mark R
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Mark,

To date I haven't received anything from MFSR regarding the attached request for Scientific advice. If you have nothing to add please let me know? Likewise, if you require additional time, please advise and I'll see what I can work out with OHMB? Although, I am not optimistic that there will be much of an extension available. These EA deadlines are legislated. I have placed a copy of the SEA report in internal mail. Specifically, in Section 4 of the SEA, comments are requested on species at risk: Wolfish, Leatherback Turtle; and COSEWIC Species: Hr. Porpoise, and Atlantic cod, ect....

Thanks,
Dale

From: Richards, Dale E
Sent: Tuesday, May 06, 2008 3:42 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Good afternoon,

Just a reminder that this information is requested by Tuesday of next week (May 13). If you require a copy of the SEA on disc please contact Janice.

Thanks,
Dale

From: Richards, Dale E
Sent: Thursday, April 10, 2008 3:41 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

A draft of the Strategic Environmental Assessment (SEA) Labrador Shelf Offshore Area has been received from OHMB for review by Science. Comments on this report are requested to be submitted to the CSA Office by **Tuesday, May 13, 2008**. The CSA office will consolidate the Branch response to OHMB.

Strategic Environmental Assessment (SEA) is a systematic and comprehensive process of evaluating the environmental effects of a policy, plan or program and its alternatives. SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which may be associated with a plan, program or policy proposal and allows for incorporation of environmental considerations at the earliest stages of program planning. The draft SEA report was prepared on behalf of the Canada-NewfoundlandOffshore Petroleum Board (C-NLOPB) by Sikumiut Environmental Ltd. The development of the report also involved a multi-stakeholder working group co-chaired by the C-NLOPB and the Nunatsiavut Government, with representatives from federal and provincial departments and agencies, One Ocean, the FFAW and the Southeastern Aurora Development Cooperation. Jim Meade, OHMB is a member of the Labrador SEA working group.

The information from the SEA will assist the C-NLOPB in determining whether exploration rights should be offered in whole or in part within the Labrador Shelf area and may identify general restrictive or mitigative measures that should be considered when conducting exploration activities. Activities associated with exploration licenses may include: conducting seismic surveys, other geophysical surveys, geotechnical and surveys; drilling of wells (either exploration or delineation); and well abandonment. If one or more exploratory drilling programs successfully identify petroleum deposits with commercial potential, production activities may follow. Production activities may involve: drilling of wells (delineation, development/production, and injection wells); installation and operation of sub sea equipment; installation and operation of production facilities; and production abandonment activities.

Given the size of the SEA report (13.6 MB), we are in the process of setting up an internal Science drive/directory where the complete SEA can be viewed or downloaded. However, in the interim complete electronic versions of the report (on disc) or hardcopy sections of the report will be made available by contacting the CSA Office (Dale) and/or Janice Lannon.

Please distribute this message further within your respective sectors. To assist with the timely review of this SEA, I have copied this message to individual researchers and/or Section Heads that have already been identified to review certain sections of the SEA report: Section 3 - Physical Environment (ESD), Section 4 - Biological Environment (AR) and Section 5 - Effects on the Assessment Area (AR and ESD).

Thank you,
Dale

*Dale Richards
Coordinator, Centre for Science Advice (CSA)
Fisheries and Oceans Canada
Newfoundland & Labrador Region
Northwest Atlantic Fisheries Centre
PO Box 5667
St. John's Newfoundland & Labrador A1C 5X1
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e-mail: richardsed@dfo-mpo.gc.ca*

Richards, Dale E

De: Wheeler, John
Envoyé: May-15-08 7:37 AM
À: Richards, Dale E
Objet: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

My apologies for not replying.

I have nothing to add regarding herring. I forwarded your request to Brian and Fran for comments on capelin and asked them to respond to you if they had any. A nil response indicates that they have no comments.

John

From: Richards, Dale E
Sent: Wednesday, May 14, 2008 3:53 PM
To: Wheeler, John
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi John,

To date I haven't received anything from Pelagics regarding the attached request for Scientific advice. If you have nothing to add please let me know? Likewise, if you require additional time, please advise and I'll see what I can work out with OHMB? Although, I am not optimistic that there will be much of an extension available. These EA deadlines are legislated. If you require a copy of the report let me know. Specifically, in Section 4 of the SEA, comments are requested on capelin and herring.

Thanks,
Dale

From: Richards, Dale E
Sent: Tuesday, May 06, 2008 3:42 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

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Thanks,
Dale

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Sent: Thursday, April 10, 2008 3:41 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
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Please distribute this message further within your respective sectors. To assist with the timely review of this SEA, I have copied this message to individual researchers and/or Section Heads that have already been identified to review certain sections of the SEA report: Section 3 - Physical Environment (ESD), Section 4 - Biological Environment (AR) and Section 5 - Effects on the Assessment Area (AR and ESD).

Thank you,
Dale

*Dale Richards
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Richards, Dale E

De: Senciall, Dave
Envoyé: May-15-08 4:06 PM
À: Richards, Dale E
Objet: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Eugene's comments

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

709-772-4883 | facsimile 709-772-4105

Acting Head,
Biological & Physical Oceanography Section,
Environmental Sciences Division, Science Branch

Dept. Fisheries and Oceans, Gov. of Canada,
Northwest Atlantic Fisheries Centre, 80 East White Hills Road
PO Box 5667 St John's NL A1C 5X1

-----Original Message-----

From: Colbourne, Eugene
Sent: Thursday, May 15, 2008 9:10 AM
To: Senciall, Dave
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

A few comments attached.

EBC



**Request for
Scientific Advice...**

From: Senciall, Dave
Sent: Wednesday, May 14, 2008 2:28 PM
To: Eugene Colbourne; Gary Maillet; Guoqi Han; James Helbig
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

All,
Further to this request for the review of the LS-SEF....

The latest Dale can process the feedback is first thing Friday morning...
So...

If each person could take a quick review of the relevant sections that Jim indicated.. looking principally for Omissions, Oversights and errors and then indicated back to me either comments or an ok message by EOB Thursday or very first thing Friday...that would be appreciated.

Thanks

~dave

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

709-772-4883 | facsimile 709-772-4105

Acting Head,
Biological & Physical Oceanography Section,
Environmental Sciences Division, Science Branch

Dept. Fisheries and Oceans, Gov. of Canada,
Northwest Atlantic Fisheries Centre, 80 East White Hills Road
PO Box 5667 St John's NL A1C 5X1

-----Original Message-----

From: Richards, Dale E

Sent: Wednesday, May 14, 2008 10:02 AM

To: Senciall, Dave

Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Dave,

The original request for this advice was sent out on April 10th. The deadlines for these EA's are very tight and the absolute latest that I could transfer the information to Habitat would be 9 am Friday morning (May 16th). Given the nature of this advice it does require RDS and Div. Manager approval/sign-off. Jim is correct I did provide him with a copy of the SEA disc on Friday.

<< Message: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th >>

Thanks,
Dale

From: Senciall, Dave
Sent: Monday, May 12, 2008 8:48 AM
To: Richards, Dale E
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale,

You'll have to move your deadline back...

~dave

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

709-772-4883 | facsimile 709-772-4105

Acting Head,
Biological & Physical Oceanography Section,
Environmental Sciences Division, Science Branch

Dept. Fisheries and Oceans, Gov. of Canada,

-----Original Message-----

From: Helbig, James

Sent: Monday, May 12, 2008 8:44 AM

To: Senciall, Dave; Maillet, Gary; Colbourne, Eugene; Han, Guoqi

Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

I would suggest that the May 13 deadline is nonsense given the fact that I was given the CD on Friday afternoon. Perhaps next Monday -- May 19??

jim

From: Senciall, Dave
Sent: 12-May-08 08:40
To: Gary Maillet; Eugene Colbourne; Guoqi Han
Cc: James Helbig
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi,,

Can each of you co-ordinate with Jim on finishing off this provision of advise request that Dale Richards sent out a few weeks back.

Please see below for areas of relevance..

The link to the document is <ftp://ocgftp.nfl.dfo-mpo.gc.ca/outgoing/helbig/>

And called forweb_Draft SEA Labrador Shelf Offshore Area_March11.pdf

Thanks

~dave

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

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Acting Head,
Biological & Physical Oceanography Section,
Environmental Sciences Division, Science Branch

Dept. Fisheries and Oceans, Gov. of Canada,
Northwest Atlantic Fisheries Centre, 80 East White Hills Road
PO Box 5667 St John's NL A1C 5X1

-----Original Message-----

From: Helbig, James

Sent: Monday, May 12, 2008 7:51 AM

To: Senciall, Dave

Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft
Report for Comment - Date due May 13th

Dave

Based on expertise in the section I would recommend:

JAH: Yellow & Cyan sections -- Bathy & Atmos

GH: Green -- Sea Conditions

EBC: Pink -- Ice

GM: Red -- Plankton

I have put the CD on the ftp site under outgoing/helbig

jim

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General

Figures 3.34 to 3.48 are of poor quality and almost impossible to read, especially when printed. For example, I cannot read the contour labeling on Fig 3.40 or Fig 3.43 among others. In addition the overall plots look blurry.

Specific Points

In the summary on page 132 the first point should have contour maps of the day of first presence, last presence and duration in days.

The second point is misleading. In the north the number of weeks of ice presence is 1 week in the offshore areas to 28 weeks near shore not 1 to 28 weeks in the north and similarly for the southern regions.

Figure 3.35 and 3.36 are not necessary, they could give the impression that ice is present year around, the plots by month should be sufficient.

Figure 3.47 according to the Environment Canada Sea-Ice atlas indicates sea ice is present in Lake Melville in late November.

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It would be useful to express some of the numbers in knots or nautical miles per day

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Figure 3.49 what years are included?

Top of page 147 the number should be $1 \times 10^{-4} \text{ km}^{-2}$ not $1 \times 10^{-4} / \text{km}^{-2}$

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--------------------------	-----

At the beginning of this section should read...Contact frequency with structures is directly related to iceberg drift speed.....

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Richards, Dale E

De: Senciall, Dave
Envoyé: May-15-08 4:07 PM
À: Richards, Dale E
Objet: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Gary Maillet comments....

This is all I have received from my section..

!~D

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

709-772-4883 | facsimile 709-772-4105

Acting Head,
Biological & Physical Oceanography Section,
Environmental Sciences Division, Science Branch

Dept. Fisheries and Oceans, Gov. of Canada,
Northwest Atlantic Fisheries Centre, 80 East White Hills Road
PO Box 5667 St John's NL A1C 5X1

-----Original Message-----

From: Maillet, Gary
Sent: Wednesday, May 14, 2008 3:54 PM
To: Senciall, Dave
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dave,

I reviewed the "very" brief section on "Plankton". The scientific studies cited in the SEA-LSOA are quite dated and lack more recent data collected on behalf of Fisheries and Oceans (Atlantic Zone Monitoring Program - http://www.meds-sdmm.dfo-mpo.gc.ca/zmp/main_zmp_e.html). No information is presented in the SEA-LSOA on potential environmental impacts on the lower trophic levels from exploration and production activities. Instead, the environmental assessment focusses on the upper trophic levels such as commercial fish/invertebrate species and marine mammals which are clearly dependent on the lower trophic levels as a prey source.

My two cents....

Gary

Please let me know if I can of further assistance.

From: Senciall, Dave
Sent: Wednesday, May 14, 2008 2:28 PM

To: Eugene Colbourne; Gary Maillet; Guoqi Han; James Helbig
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

All,
Further to this request for the review of the LS-SEF....

The latest Dale can process the feedback is first thing Friday morning...

So...

If each person could take a quick review of the relevant sections that Jim indicated.. looking principally for Omissions, Oversights and errors and then indicated back to me either comments or an ok message by EOB Thursday or very first thing Friday...that would be appreciated.

Thanks
~dave

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

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-----Original Message-----

From: Richards, Dale E

Sent: Wednesday, May 14, 2008 10:02 AM

To: Senciall, Dave

Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Dave,

The original request for this advice was sent out on April 10th. The deadlines for these EA's are very tight and the absolute latest that I could transfer the information to Habitat would be 9 am Friday morning (May 16th). Given the nature of this advice it does require RDS and Div. Manager approval/sign-off. Jim is correct I did provide him with a copy of the SEA disc on Friday.

<< Message: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th >>

Thanks,
Dale

From: Senciall, Dave
Sent: Monday, May 12, 2008 8:48 AM
To: Richards, Dale E
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale,

You'll have to move your deadline back...

~dave

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

709-772-4883 | facsimile 709-772-4105

Acting Head,
Biological & Physical Oceanography Section,
Environmental Sciences Division, Science Branch

Dept. Fisheries and Oceans, Gov. of Canada,
Northwest Atlantic Fisheries Centre, 80 East White Hills Road
PO Box 5667 St John's NL A1C 5X1

-----Original Message-----

From: Helbig, James

Sent: Monday, May 12, 2008 8:44 AM

To: Senciall, Dave; Maillet, Gary; Colbourne, Eugene; Han, Guoqi

Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

I would suggest that the May 13 deadline is nonsense given the fact that I was given the CD on Friday afternoon. Perhaps next Monday -- May 19??

jim

From: Senciall, Dave
Sent: 12-May-08 08:40
To: Gary Maillet; Eugene Colbourne; Guoqi Han
Cc: James Helbig
Subject: FW: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi,,

Can each of you co-ordinate with Jim on finishing off this provision of advise request that Dale Richards sent out a few weeks back.

Please see below for areas of relevance..

The link to the document is <ftp://ocgftp.nfl.dfo-mpo.gc.ca/outgoing/helbig/>

And called forweb_Draft SEA Labrador Shelf Offshore Area_March11.pdf

Thanks

~dave

Dave Senciall, dave.senciall@dfo-mpo.gc.ca *PLEASE NOTE NEW E-MAIL ADDRESS

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Acting Head,
Biological & Physical Oceanography Section,
Environmental Sciences Division, Science Branch

Dept. Fisheries and Oceans, Gov. of Canada,
Northwest Atlantic Fisheries Centre, 80 East White Hills Road
PO Box 5667 St John's NL A1C 5X1

-----Original Message-----

From: Helbig, James

Sent: Monday, May 12, 2008 7:51 AM

To: Senciall, Dave

Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dave

Based on expertise in the section I would recommend:

JAH: Yellow & Cyan sections -- Bathy & Atmos

GH: Green -- Sea Conditions

EBC: Pink -- Ice

GM: Red -- Plankton

I have put the CD on the ftp site under outgoing/helbig

jim

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Richards, Dale E

De: Helbig, James
Envoyé: May-16-08 9:13 AM
À: Richards, Dale E
Cc: Senciall, Dave
Objet: Comments on LS SEA

Comments on Sections 3.2, and 3.5

I have only one comment: the legend in Figure 3.32 appears to be reversed implying that the region has very low visibility throughout the year.

Other than that, these sections are acceptable.

Jim

Richards, Dale E

De: Taylor, Dave
Envoyé: May-16-08 9:25 AM
À: Stansbury, Don
Cc: Richards, Dale E
Objet: FW: Draft SEA Labrador

Don, I've made some minor changes and copied my comments to Dale. Dave

From: Taylor, Dave
Sent: Thursday, May 15, 2008 3:57 PM
To: Stansbury, Don
Subject: Draft SEA Labrador

Don, I've looked over the document as requested and have several comments:

1. Overall, the document is not very well written, and does not cite pertinent recent publications that should be referenced in support of statements regarding biological data. It should really be reviewed thoroughly by a competent professional(s) familiar with the scientific literature and fishery data. Perhaps this would get rid of a lot of the unnecessary repetition that is evident.
2. Fig. 4.33: presents a pie chart showing the % of the Labrador landings constituted by snow crab. This appears to be a % of landed weight rather than value which under represents the importance of snow crab in Labrador.
3. Table 5.7: the table which reports "spawning" period for crab provides no references and probably represents the minimum period for larval hatching and/or egg extrusion that this population demonstrates.
4. It may be worth while to calculate average snow crab landings from the bid parcels where exploration is proposed.

If you wish a more thorough review, I'll certainly do it but at best it appears to me to be an exhaustive but superficial study. Dave

Richards, Dale E

De: Stansbury, Don
Envoyé: May-16-08 10:19 AM
À: Richards, Dale E
Objet: FW: SEA

Dale,

Comments from Dave Orr and Taylor on the SEA project.

Don S.

From: Orr, David
Sent: Thursday, May 15, 2008 10:36 AM
To: Stansbury, Don
Subject: RE: SEA

Hi Don,

Attached are my comments using track change and a map indicating the shrimp fishing locations.



Shrimp fishing
areas 4-6 with ...



SEA Shrimp (DFO
comments).doc

Dave

Comments from Dave Taylor re: Snow Crab

1. Overall, the document is not very well written, does not cite pertinent recent publications that should be referenced. It should really be reviewed thoroughly by a competent professional's) familiar with the scientific literature and fishery data. Perhaps this would get rid of a lot of the unnecessary repetition.

2. Fig. 4.33: presents a pie chart showing the % of the Labrador landings constituted by snow crab. This appears to be a % of landed weight rather than value which under represents the importance of snow crab in Labrador.

3. Table 5.7: the table which reports "spawning" period for crab provides no references and probably represents the minimum period for larval hatching and/or egg extrusion that this population demonstrates.

4. It may be worth while to calculate average snow crab landings from the bid parcels where exploration is proposed.

If you wish a more thorough review, I'll certainly do it but at best it appears to me to be an exhaustive but superficial study.

Dave

From: Stansbury, Don
Sent: Thursday, May 15, 2008 10:11 AM
To: Orr, David
Subject: SEA

<< File: SEA Shrimp.doc >>

This is from a

PROJECT NO. P 064

**PROPOSAL TO Canada-Newfoundland and Labrador
Offshore Petroleum Board**

5th Floor TD Place, 140 Water Street ·

St. John's, NL · A1C 6H6 ·

FOR

**Strategic Environmental Assessment
ON Labrador Shelf Offshore Area**

March 2008

Sikumiut Environmental Management Ltd.

Suite 200 - 80 Elizabeth Avenue

St. John's, Newfoundland and Labrador,

A1A 1W7

Phone: 709-754-0499

Fax: 709-754-1445

www.sikumiut.ca

s.16(2)

s.19(1)

Don Stansbury

Section Head

Shellfish Section

Aquatic Resources Division, Science Branch

DFO

(709) 772-0559 W

**C
H**

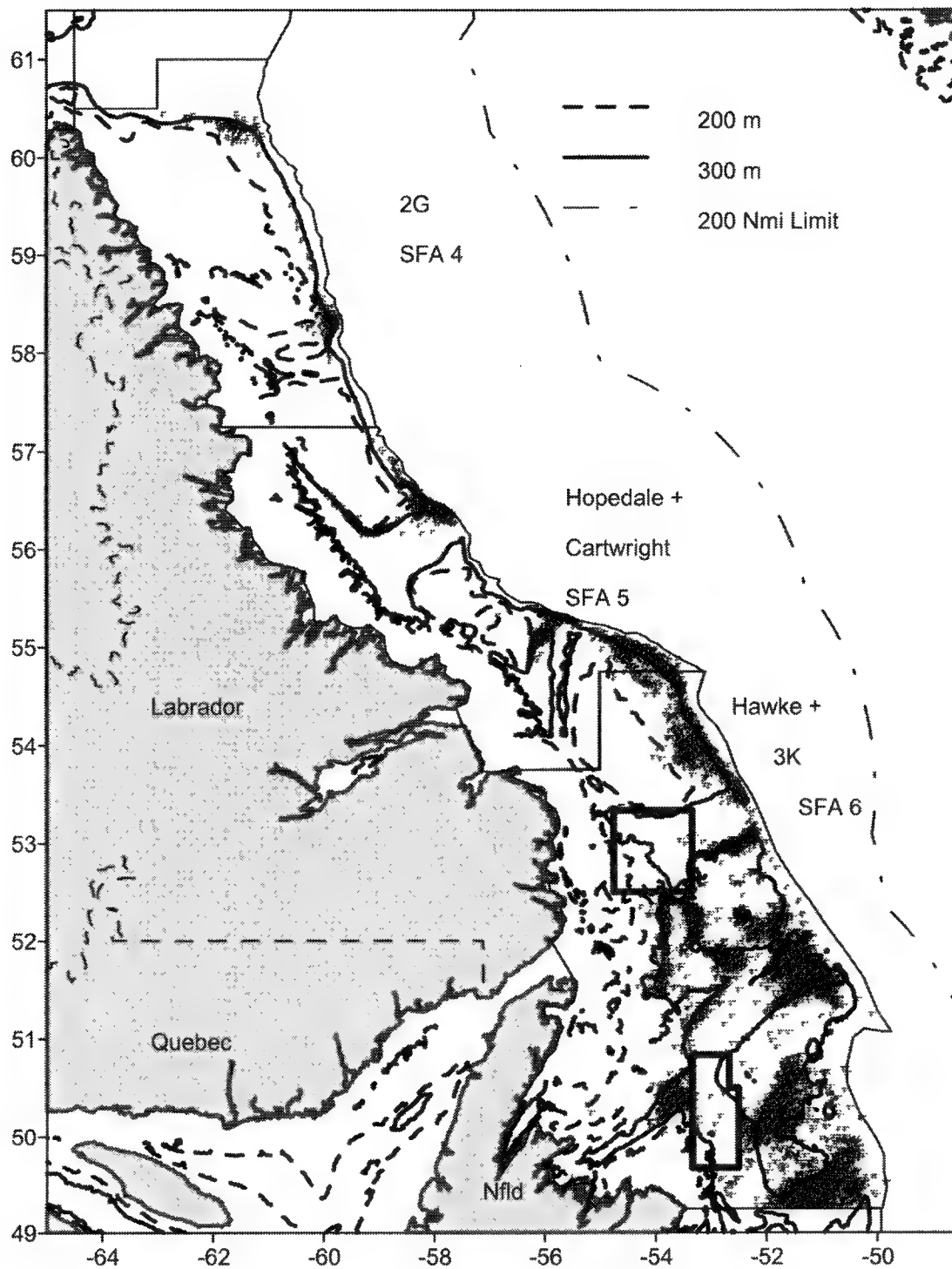


Figure 1. Map of northern shrimp fishing areas (SFA's) including the Hawke Channel and Funk Island Deep closed areas. The Funk Island Deep closed area is mandatory for small vessels and voluntary for large vessels. The red crosses indicate large and small vessel fishing positions during 2007.

4.4.3 Northern Shrimp

Northern or pink shrimp (*Pandalus borealis* spp.) distributions in the Northwest Atlantic range from the Davis Strait to the Gulf of Maine. They occupy shallow inshore waters to depths of 180 m on soft muddy substrates in temperatures of 2-6°C. Larger individuals generally occur in deeper waters (DFO 2006c). Shrimp undergo a diel vertical migration, moving off the bottom into the water column during the day to feed on small pelagic crustaceans. They migrate up the water column at night, feeding on pelagic copepods and krill (DFO 2006c). Female shrimp also undergo a seasonal migration to shallow water where spawning occurs (DFO 2006c). Northern shrimp are a protandric hermaphrodite, meaning that it first functions sexually as a male, undergoes a brief transitional period, and spends the rest of its life as a female (DFO 2006c). Eggs (1,700 for the average female) are laid in the summer and remain attached to the female until the following spring, when the female migrates to shallow coastal waters to spawn (Nicolajsen 1994, in Ollerhead et al. 2004). The hatched larvae float to the surface feeding on planktonic organisms (DFO 2006c). As with most crustacea, northern shrimp grow by moulting their shells. During this period, the new shell is soft, causing them to be highly vulnerable to predators such as Greenland halibut (turbot), cod (DFO 2006c), Atlantic halibut, skates, wolffish and harp seals (*Phoca groenlandica*) (DFO 2000b). During collection of traditional knowledge (Nain 2007; Makkovik 2007) and at public consultations (Nain 2007; Natuashish 2007; Hopedale 2007; Happy Valley-Goose Bay 2007; Mary's Harbour 2007; Port Hope Simpson 2007) it was indicated that northern shrimp were fished within the Labrador Shelf SEA Area. The areas in which northern fish may be fished included areas between Makkovik and Hopedale (Nain 2007; Natuashish 2007; Hopedale 2007; Happy Valley-Goose Bay 2007; Mary's Harbour 2007; Port Hope Simpson 2007).

Commentaire [D1]: If they use spp. Then they must include all species which would include more than just the northern or pink shrimp.

Mis en forme : Police :Italique

Commentaire [D2]: This is not true. The bulk of the commercial fishery takes place in waters ranging from 200 – 500 m. The fishery takes place well offshore; however, females do migrate into shallower cooler water during spring.

Commentaire [D3]: This is probably a little low. According to FAO Fisheries Synopsis No. 144 the average female (Carapace length = 28 mm) should carry approx. 2400 eggs.

Commentaire [D4]: They will be vulnerable to predators regardless of whether they have a soft shell.

Commentaire [D5]: They are fished along the coast of Labrador and off Northeastern Newfoundland. Attached is a map of the 2007 fishing areas.

Richards, Dale E

De: Han, Guoqi
Envoyé: May-16-08 9:09 AM
À: Richards, Dale E
Cc: Senciall, Dave; Helbig, James
Objet: Review for 3.2 to 3.4 of LS SEA

Hi Dale,

Attached please see my comments.



LS_SEA_comme...

Guoqi

Guoqi Han
Fisheries and Oceans Canada
Northwest Atlantic Fisheries Centre
St. John's, NL, A1C 5X1
Canada

Phone: (709) 772-4326
Email: guoqi.han@dfo-mpo.gc.ca *NEW ADDRESS
<URL: <http://www.physics.mun.ca/~ghan>>

Comments on Section 3.2 to 3.4

Page 106, Line 1-3: The description on the seasonal SST change is confusing. It should be reworded.

3.4.4 Current: The Labrador Current has significant interannual and longer-term variability, in response to climate variability and change. A discussion of knowledge regarding the interannual and decadal variability of the Labrador Current should be included. See for example, Han, 2005, Continental Shelf Research; Hakkinen and Rhines, 2004, Science; Han and Tang, 1999, Journal of Physical Oceanography.

There is a significant onshore current south of Hamilton Bank, which is not represented in Figure 3.25.

Page 118, 1st paragraph. The description needs improvement. Readers have to guess Fig. 3.26 is from “the previous Labrador Sea model”. If the model physics is similar, how can the new model improve the result over the Labrador Shelf? By imply including the Scotian Shelf and the Gulf of St. Lawrence?

In terms of the seasonal and spatial variability of the Labrador Shelf circulation, the report could include a more detailed and better illustration either based on the BIO model, or on a finite element model developed for the PERD project by DFO Newfoundland.

Table 3.23: Definitions for Column 7 and 8 are not clear. My guess is they are mean velocity magnitude and mean velocity direction, respectively.

What does steadiness mean in Table 3.23? Is it necessary to be included?

What about current meter data after 1980? For example, DFO collected multi-year current meter data during 1985 to 1987 (Lazier and Wright, 1993, Journal of Physical Oceanography).

Line 122: It is impossible for the K_1 tidal currents to be “3.1 to 2.5 m/s”.

Change “M2” to “ M_2 ”, “S2” to “ S_2 ”, “K1” to “ K_1 ” and “O1” to “ O_1 ”.

Table 3.24: Major and Minor axes have a unit of cm/s, but Inc. has a unit of degree.

Richards, Dale E

De: Power, Don
Envoyé: May-16-08 9:10 AM
À: Richards, Dale E
Objet: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Dale,

Here are my comments on the Labrador Shelf EA. I believe you also received comments from Joanne. I have a copy of those attached in the text of an email as well. I looked at the report independent of Joanne's comments so there may be some redundancy.

This is as close as you'll get to meeting the deadline for me !!

Don



Lab SEA Env
report DPower c...

Request for
Scientific Advice...

From: Richards, Dale E
Sent: Friday, May 09, 2008 9:52 AM
To: Power, Don
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Hi Don,

Nope, given the new service delivery methods of IMTS I am still awaiting action on the server request. I will drop by later this morning with a copy of the SEA on disc for you. Let me know if you require additional copies for others within the groundfish Section.

Dale

From: Power, Don
Sent: Thursday, May 08, 2008 11:52 AM
To: Richards, Dale E
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Dale,

Is this report on a server?

Don

From: Richards, Dale E
Sent: Tuesday, May 06, 2008 3:42 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: RE: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

Good afternoon,

Just a reminder that this information is requested by Tuesday of next week (May 13). If you require a copy of the SEA on disc please contact Janice.

Thanks,
Dale

From: Richards, Dale E
Sent: Thursday, April 10, 2008 3:41 PM
To: Power, Don; Stenson, Garry; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Senciall, Dave; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Pepin, Pierre; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Clarke, Keith
Cc: Davis, Ben; McCallum, Barry; Tillman, Joe; Goodyear, Julian; Meade, James; Bieger, Tilman; Lannon, Janice
Subject: Request for Scientific Advice/Information: Labrador Shelf Strategic Environmental Assessment - Draft Report for Comment - Date due May 13th

A draft of the Strategic Environmental Assessment (SEA) Labrador Shelf Offshore Area has been received from OHMB for review by Science. Comments on this report are requested to be submitted to the CSA Office by **Tuesday, May 13, 2008**. The CSA office will consolidate the Branch response to OHMB.

Strategic Environmental Assessment (SEA) is a systematic and comprehensive process of evaluating the environmental effects of a policy, plan or program and its alternatives. SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which may be associated with a plan, program or policy proposal and allows for incorporation of environmental considerations at the earliest stages of program planning. The draft SEA report was prepared on behalf of the Canada-NewfoundlandOffshore Petroleum Board (C-NLOPB) by Sikumiut Environmental Ltd. The development of the report also involved a multi-stakeholder working group co-chaired by the C-NLOPB and the Nunatsiavut Government, with representatives from federal and provincial departments and agencies, One Ocean, the FFAW and the Southeastern Aurora Development Cooperation. Jim Meade, OHMB is a member of the Labrador SEA working group.

The information from the SEA will assist the C-NLOPB in determining whether exploration rights should be offered in whole or in part within the Labrador Shelf area and may identify general restrictive or mitigative measures that should be considered when conducting exploration activities. Activities associated with exploration licenses may include: conducting seismic surveys, other geophysical surveys, geotechnical and surveys; drilling of wells (either exploration or delineation); and well abandonment. If one or more exploratory drilling programs successfully identify petroleum deposits with commercial potential, production activities may follow. Production activities may involve: drilling of wells (delineation, development/production, and injection wells); installation and operation of sub sea equipment; installation and operation of production facilities; and production abandonment activities.

Given the size of the SEA report (13.6 MB), we are in the process of setting up an internal Science drive/directory where the complete SEA can be viewed or downloaded. However, in the interim complete electronic versions of the report (on disc) or hardcopy sections of the report will be made available by contacting the CSA Office (Dale) and/or Janice Lannon.

Please distribute this message further within your respective sectors. To assist with the timely review of this SEA, I have copied this message to individual researchers and/or Section Heads that have already been identified to review certain sections of the SEA report: Section 3 - Physical Environment (ESD), Section 4 - Biological Environment (AR) and Section 5 - Effects on the Assessment Area (AR and ESD).

Thank you,
Dale

*Dale Richards
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DPower Comments

Section 4.1.2.1 Wolffish

The footnote on Figs. 4.1, 4.2, 4.3: “*Note: Darker shades denote greater distribution*”.....Likely the darker shading denotes greater density

Page 171 (pdf page 196) notes the following “*Though not as great as the other species, the Atlantic wolffish (or the striped wolffish) has also declined in population and distribution (see Figure 4.3)*.....clarification required on what “Though not as great” means.

Section 4.1.2.2 Blue Wales

The following statement: “*The global blue whale population is estimated at 5,000 to 12,000 individuals; although to date, there are no reliable estimates*”.....First there is no reference provided for these estimates, and second, what is meant by the last part (underlined)?

Section 4.2.1 Atlantic cod

Page 183 (pdf page 208) notes the following:

“*The northern cod stock is distributed east off Newfoundland and Labrador’s east coast from Subdivision 2G to Subdivision 3L (DFO 2007b)*.”.....2G should be 2J...2GH is considered a separate stock.

“*Tagging experiments have shown that the Northern cod stock is relatively isolated from adjacent stocks in divisions 2J3KL, 4TVn, and 3Ps.*”remove 2J3KL as this IS the northern cod stock.

“*However, the stock does occasionally mix in the Northwest Gulf with 4TVn cod, and in the Strait of Belle Isle with 2J3KL cod (Yvelin et al. 2005).*”The stock referred to here is from the perspective of the Northern Gulf stock (4RS3Pn), therefore replace 2J3KL cod with 4RS3pn cod...this latter stock is referred to as the Northern Gulf cod stock.

Section 4.4.4 Redfish

Page 208 (pdf page 233) notes the following term when referring to the reproductive biology: “*...icethotropic viviparous...*”.....I’ve never heard of the term icethotropic but perhaps the term lecithotrophic was intended (larvae feeding exclusively on energy stored in the yolk)?

Section 4.4.6 Greenland halibut

In general, there has been much research on Greenland halibut biology subsequent to the most recent references contained in this section (1988).

Page 211 (pdf page 236). “*Notes the following: Spawning occurs in deep warm waters of the Davis Strait.*”This is quite a dated statement. The following is taken from Fishery Bulletin, July, 2002, by Jesper Boje: “*The spawning grounds of Greenland halibut are believed to be located southwest of Iceland (Sigurdsson1) and cover an extended area from Davis Strait, south of 67[degrees]N (Jensen, 1935; Smidt, 1969) to south of Flemish Pass off Newfoundland (Junquera and Zamarro, 1994) between 800 and 2000 m depths.*” In addition see Morgan et al (MS 2001). Comparative Analyses of Greenland Halibut (*Reinhardtius hippoglossoides*) Maturation for Populations Throughout the North Atlantic. NAFO SCR Doc 01/116 Ser. No. N4504 and references therein.

Section 4.4.9 Rock Cod

Page 215 (pdf page 240) The scientific name for Rock cod is *Gadus ogac* not *Lotella rhacina*. The latter is in the Family Moridae as opposed to *Gadus ogac* which is in the Family Gadidae.

Section 4.9.2 Historical Overview

Page 243 (pdf page 268). With respect to Figure 4.31 (NAFO catches 2GHJ, All countries + Canada Only, 1960-2005).....The X-Axis scale is missing but the graph suggests there were foreign catches within the 2GHJ Divisions in the latter period in the order of 45,000-60,000 tons. This is not correct and the values in this figure need to be checked because the only foreign effort in 2GHJ since 1994 has been outside the 200-mile limit and the only species caught there is redfish, but the level of such catches is not in the order 45,000-60,000 tons. The graph says 1960-2005 but in the text notes the period is 1985-2005.

Figure 4.32 shows a similar trend to Fig. 4.31 but a smoothed line is used, yet a much different scale is used (largest catch in graph is about 120,000 tons...largest in Fig. 4.3.1 is over 180,000 tons). A better explanation of the differences between Fig. 4.31 and 4.32 should be provided. It is also not clear what source was used in Fig. 4.31 but the text indicates for Fig 4.32 “...Catches for NAFO-regulated species by foreign and domestic harvesters, based on NAFO statistics, are shown in Figure 4.32.”

Table 4.9 suggests the average total domestic catch from 2004-2006 is about 136,000 tons. This is not consistent with the most recent values in Fig. 4.31 and 4.32

Section 4.9.7.4 Witch Founder

Page 303 (pdf page 328). The statement “...Age data from fishery and DFO surveys have not been collected since 1994.....” This statement is not accurate in regard to the DFO survey – aging material (otoliths) has been collected annually since 1994 but have not been aged due to a lack of technical expertise.

Section 4.9.7.5 Greenland Halibut

Page 303 (pdf page 328). The statement “...Abundance and biomass estimates carried out in both spring and autumn multi-species surveys have been sporadic, especially in Divisions 2GH.” Is not correct...This should read: “...they have been sporadic in Divisions 2GH, especially in Division 2G.

Other comments:

Check for spelling of Atlantic cod (*Gadus morhua*...not *morhue*)

Check for spelling of Atlantic (striped) wolffish (*Anarhichas lupus*...not *lumpus*)

**Pages 65 to / à 68
are duplicates of
sont des duplicatas des
pages 3 to / à 6**

Richards, Dale E

De: Richards, Dale E
Envoyé: May-20-08 1:37 PM
À: Meade, James
Objet: FW: Labrador Shelf SEA - Science Review of the DRAFT Report

Importance: Haute

Hi Jim,

I received your voice mail on Friday.

An additional response from Science is attached (Labrador Shelf SEA - Orr.doc). If or when the new deadline is established from the C-NLOPB would you be able to please advise of the revised date for submission of comments. I know that Bob's and Jerry's comments are still outstanding and they could use the additional flexibility with timing.



Labrador Shelf
SEA - Orr.doc

Thanks,
Dale

From: Richards, Dale E
Sent: Friday, May 16, 2008 10:05 AM
To: Meade, James
Cc: Grant, Carole; Tillman, Joe
Subject: Labrador Shelf SEA - Science Review of the DRAFT Report
Importance: High

Hi Jim,

Attached is the Science Review to the draft Labrador Shelf Strategic Environmental Assessment (SEA) Report. As noted in an earlier e-mail, I anticipate comments to be forthcoming from at least two other scientist (Gregory and Payne). I will forward these reviews when they are received.



Review of the
Labrador Shelf S...



Labrador Shelf
SEA - Anderson...



Labrador Shelf
SEA - Aquacultu...



Labrador Shelf
SEA - Maillet.d...



Labrador Shelf
SEA - Morgan.d...



Review of the
Grassy Point LN...



Review of the
Labrador Shelf S...



Review of the
Labrador Shelf S...



Labrador Shelf
SEA - Colbourne...



Labrador Shelf
SEA - Power.doc...



Labrador Shelf
SEA - Han.doc



Labrador Shelf
SEA - Helbig.do...



Labrador Shelf
SEA - Taylor.do...

Regards,
Dale

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No information has been removed or severed from this page

Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

B. Sjare, Marine Mammals Section

May 12, 2008

Personnel from the Marine Mammal Section reviewed relevant sections of Chapter IV – The Biological Environment in detail. Various other related sections were reviewed in less detail to get an overall perspective of the document as well as to determine how comprehensive the material on marine mammals was compared to other sections of the document.

General Comments:

-The Introductory Chapter outlines the scoping process that was conducted for this SEA. It appears to have been fairly extensive. As has been mentioned with previous SEA documents, it would be beneficial from everyone's perspective if Science Branch researchers were involved in this process at an early stage. Several of the following key short-falls could have been dealt with and the result would have been a much more useful and informative document.

-There are three main weaknesses in this document that should be addressed by the inclusion of new text and better linkages between existing sections of text.

1) In Chapter 4 there appears to be no mention of the large scale ecosystem changes that have occurred in the NW Atlantic since the mid-1980s. It is not possible for a SEA document with the said objectives to not include and acknowledge these large scale changes. Even in the commercial fish section the graphics clearly show how the industry has radically changed and yet there is no ecological framework provided. These large scale changes should be appropriately indicated for all the species that are discussed – particularly the ones that are considered 'keystone' such as capelin and Arctic cod (which is not even included in the document). This concern has been raised in at least one previous SEA document and there seems to have little movement to address this problem. It should be addressed in this document.

2) There is also no acknowledgement or recognition of the importance of climate variability and climate change. Some of the pertinent information for this topic will be covered off and integrated with the presentation of data on large scale ecosystem change; however, there should be a section on future climate projections for eastern Canada. There are regional models becoming available that provide our first 'look' forward at what conditions are going to be like over the next 25 to 50 years. This is relevant information that should be taken into consideration throughout the text of this SEA document. Looking briefly through the commercial fish section, the sea ice section and project related effects section (e.g. oil spill section), there is no evidence this has been attempted.

3) There is little attempt (except in the sea bird section) to integrate and synthesize existing information within an ecosystem framework. It is recognized

that this can't be done in all cases or for all species, but it is important that initial steps be taken since this is the direction that DFO is moving nationally – clients must recognize this. Similarly, if DFO requires that their clients adopt this approach, then we (the Department) must consistently push for compliance.

Addressing these shortcomings in the document would have been much easier if the need had been identified earlier. However, some key insertions of text in each section of the document (where appropriate) will be an improvement. This should be the approach taken.

-There is new abundance and distribution information becoming available for some cetacean species based on a series of large scale surveys conducted in 2007 (TNASS Project). Depending on the timeframe of availability of these data, they should be included in the document. If not available, there should at least be a statement indicating that new information will be available in the near future for these species (Contact: Jack Lawson, DFO).

-Throughout the document the scope, type and detail of information on each topic varies significantly. Some sections like sea ice, corals and aspects of underwater noise are very detailed, use original references and are current. They are well written and provide information that is specific to the region, and they are useful. However, other sections are overly brief, simplified, use very general and often older references and end up providing an inaccurate perception of the topic in question and don't reflect the ecological importance of the species or topic (e.g. some of the marine mammal species, zooplankton, some of the fish species). In many cases information does not exist to address species/topics in such detail. This is an important point and should be more clearly stated in the relevant sections of text. Given the objectives of a SEA document, a better balance needs to be achieved.

-In the case of marine mammal species where specific SEA regional data (and in many cases, any data at all) are lacking, general biological information from other parts of its range as well as 'global' or 'northern hemisphere' abundance information is provided. This information is important, but should not overshadow or deflect attention away from the fact we know nothing about the species in the SEA region or the fact the species may be a listed SARA species e.g. the text on the blue whale; rewording is required in cases such as this

-Much of the marine mammal species accounts are taken from COSEWIC documents that have to be somewhat general by their nature; hence some of the information does not reflect the biology, migratory behavior and social behavior of the species in Newfoundland and Labrador waters. When available, key original references and regionally specific information should be presented. Again, when there is a paucity of data it has to be more clearly noted rather than adding information that is not really relevant to the area.

-The strong focus on primarily commercial fish species somewhat compromises the intent of a SEA given that ecologically important species are not included. This is particularly glaring with the omission of Arctic cod which is a key-stone species. Information on this species should be included. Other sections of text should be

examined for similar types of content gaps which relate back to the lack of an ecosystem framework for the document.

2.3 Regional Acoustic Characteristics of Cetaceans (Table and Text):

- Cetacean species as listed are fine; however pinnipeds also communicate acoustically and can be masked by industrial noise. This is particularly the case for bearded seals and, to a lesser degree ringed seals. Cases, could also be made for hooded and harp seals at certain times of the year.

- At least bearded and ringed should be listed in the table (and generally considered/included in all subsequent sections of related text)

Figures 4.1 and 4.2 – Distribution and Density of Wolffish

- The figure captions should be checked; the word 'distribution' should probably be replaced by 'density'.

4.1.2.2 Blue Whale

- As written the opening text for the section doesn't appropriately emphasize the serious situation Blue whales of the northern hemisphere are in; . . . 'blue whales are found globally'. . . . the opening paragraph should be reworded to reflect this.

- Compared to text on the fin whale, the blue whale information is less detailed and vague; general life history information is missing.

- There is a list of projected related stressors listed (e.g. ship collisions) in the last paragraph of the text; disturbance due to industry related underwater noise should also be included.

Table 4.2 – COSEWIC List of Species

- Delete western Hudson Bay from the range/population designation column (this population is not endangered) and correct its' status.

- Walrus should be added to the table since the Arctic population is listed as threatened and walrus that are observed along the Labrador coast, primarily in the pack-ice zone are from this population.

- Ensure related walrus text is inserted in text.

- Given that it is not certain that the beluga along the Labrador coast are from the eastern Hudson Bay stock, the listings of the Cumberland Sound and eastern Arctic populations should also be included in the table.

4.2.4 Beluga

- Check entire document for reference to the Labrador Inuit Association (LIA) – replace with Nunatsiavut Government or other related designation.

-In the sentence referring to the stock affinities of the beluga whales observed in Labrador waters - the eastern Hudson Bay population must be included in addition to the Ungava Bay population. However, it is also possible that there are whales from the Cumberland Sound population, or even Western Hudson Bay. The sentences in question need rewording – check the most current stock status reports for beluga whales on DFO Publication web site.

4.2.6 Harbour Porpoise

-Correct the reference for harbour porpoise by-catch levels – should be Benjamins et al.

-Correct 'Lance' to lance.

4.3.3.2 Zooplankton (General Comment as scanning through document)

-This section seems overly brief and general compared to the phytoplankton and is of little use as presented.

There is no mention of the Atlantic Zonal Monitoring Program in these sections. This information should be included.

4.4.8 Capelin

-Given the importance of this species in the SEA region, this is a very general section that needs an upgrade in references and more regional specific information. It also is a section that requires a discussion of long term changes in the resource (i.e. effects of ecosystem change and impact of future climate change).

-Some rewording is required to ensure that the reader is not left with the impression that capelin may spawn in early June in coastal Labrador – this is not correct.

4.5 Data Gaps for Fish

-This section needs to be rewritten. It is vague, convoluted and not informative compared to other Data Gap sections.

4.6.1.2 Sei Whale

-Insert reference for evidence of two stocks.

4.6.1.3 Bowheads

-The sentence '*No live bowheads for a century. . . .*' needs to be put into the proper context. There have been several standings in Newfoundland waters in more recent years suggesting whales still occasionally use the area; these references should be inserted. There is a high likelihood that the species uses the northern areas of SEA region – this should also be reflected.

4.6.2.3 Killer Whales

-This section needs to be updated with a recent publication or pers comm. from J. Lawson. In recent years killer whales sightings are more common than the text implies.

Figure 4.25 Seal Sightings and Distribution

-This figure should be deleted because it is based on so little data and it is not representative for any of the species. In fact, it leaves the reader with an incorrect perspective of seal distribution.

-Check that there is an appropriate reference for all the marine mammal sighting maps somewhere earlier in the text.

4.6.3.1 Harbour Seals

-Readers should not get the impression that harbour seal pups don't go in the water until after the weaning period. The last two sentences of the first paragraph should be reworded.

4.6.3.1 Harp Seals

-Update population estimates and references (2004 survey information is available on DFO web site).

-Check the sentence that indicates '*Atlantic cod*' comprises 54% of the harp seal diet - it should probably be '*Arctic cod*' or there is some other mistake or missing contextual information. Regardless, the sentence is an over simplification and provides an inaccurate perception of harp seal diet given the annual, seasonal, geographic and age class variations that exist.

-Change the sentence . . . '*harp seals are expected to be common in the SEA region.* .' to '*they are common in the SEA region*'.

-It should be noted that in most years a substantial proportion of the harp seals pupping in Newfoundland and Labrador waters do so in the southern portion of the SEA region. This has implication for the impact assessment of oil spills and possibly other industry related activities.

-TEK information is minimal for this species in the text. Brice-Bennett (1977) is cited. There needs to be a detail on current subsistence use and evolving commercial use. The Nunatsiavut Government has plans to become more actively involved in encouraging increased participation the harp seal commercial hunt.

4.6.3.2 Hooded Seals

-There are new 2004 population estimates available for this population on the DFO web site.

-As in the case with harp seals, in most years a substantial proportion of the hooded seals pupping in Newfoundland and Labrador waters do so in the southern portion of the SEA region. This information should be added to the text.

4.6.3.4 Bearded Seals

-The sentence indicating. . . . 'Seasonal movements are directly related to sea ice. . . .' should be reworded. Along the Labrador coast some bearded seals remain in coastal waters during the summer and may not follow the receding ice northward. As written the above sentence is an over simplification that gives an incorrect impression of the ecology and movement patterns of the species for the SEA region.

-Including information on weights, lengths and body condition deviates from the format for the other seal species. Similar information is available for them as well. Suggest adding complimentary information for the others, or deleting it here.

-TEK information is missing.

4.6.3.5 Grey Seals

-Reword the sentence pertaining to grey seal distribution – ' . . .grey seals are present in the SEA region. . . '

4.6.3.6 Ringed Seals

-Reword and add additional information regarding this sentence – ' . . . no compelling evidence that ringed seals undertake co-ordinated seasonal migrations.' The meaning of the sentence is unclear because 'co-ordinated' is not defined. Nor is it clear what comparisons are being made. More emphasis should be placed on the variable nature of the movement patterns that have been documented: some animals don't move, other move relatively short distances (within 100-300 miles) and others move several thousand miles. As written the sentence and related text does not accurately reflect the movement behavior of this species in general and it does not provide information that is more specific to the coast of Labrador.

4.6.4 Marine Mammal and Turtle Data Gaps

-The section outlines the general areas where data gaps exist; however, it should be made clear that even for species that are relatively well studied in parts of their range – little is known about what goes on in Labrador waters. This point gets lost in the generalities.

4.10 Sensitive Areas and 4.10.9 Data Gaps for Sensitive Areas

-There are no sensitive areas for marine mammals mentioned; this is primarily because so little is known. This point needs to be reflected and emphasized in the text. There is a significant amount of evidence that indicates areas important for marine birds are also likely important for a variety of marine mammals species (and there are some sensitive sea bird areas identified in the text).

4.10.1 Regulatory Framework

This section lists and outlines the mandates for key Acts – e.g. the Marine Mammal Act and the Fisheries Act. However, the Oceans Act and SARA are not included.

Dr. Becky Sjare
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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

M. R. Anderson, Ecological Sciences Section

May 13, 2008

s.19(1)

As requested, I have reviewed the document entitled "Draft Two Report: Strategic Environmental Assessment Labrador Shelf Offshore Area". I have a number of general comments followed by specific or detailed concerns.

General comments:

The document is deficient in the description of the existing biological environment. In particular Section 4.3 which should contain the general biological framework of the ecosystem is lacking in rigor and in documentation. It is **not acceptable** in its current format.

The description of the lower foodweb demonstrates a clear lack of understanding of the fundamental processes and ecological dynamics supporting primary and secondary production on the Labrador Shelf. The sections on plankton are very poor and deficient. The microbial web is omitted completely. Contributions to primary production by ice algae, macroalgae and seagrasses are also ignored.

In numerous places the authors note that information is lacking about the biology and ecology and of the Labrador Shelf Area. While much remains to be learned, there is a long history of biological studies in the region little of which is referenced in this document. It is clear that the authors have omitted reference to most of the relevant literature. Much of this literature was reviewed in the "Offshore Labrador Initial Environmental Assessment" (Petro Canada 1982) and in the detailed studies of the OLABS program. It should be a simple matter to update the material since that time.

Assessment of the risks associated with exploration for and production of oil and gas in the Labrador Shelf Area are based on the assumption that accident and spill data from temperate regions around the world adequately reflect the level of risk of such developments on the Labrador Shelf. While the regulatory regime and the technologies may be similar this is not the case for the environmental conditions. The most appropriate comparison groups would be from the Grand Banks or regions like the Beaufort Sea or Sakhalin Island where ice conditions and severe weather might be assumed to be similar as a first basis for comparison. The importance of failing to meet this basic assumption in selection of a comparison group is clear when the oil spill statistics for the Grand Banks are compared with those from the US OSC or the North Sea used to calculate the associated risks. According to the data presented in section 2.6.5 spills are orders of magnitude more frequent on the Grand Banks than elsewhere. This is a concern. Arctic environmental conditions should be taken into consideration in these calculations.

s.21(1)(b)

Ice as a habitat is not mentioned in the document. The ice algae community is not discussed and its contribution to primary production is ignored. Ice as habitat for marine mammals is similarly ignored. As a result the consequences of an oil spill in ice are not addressed in this context. The document also down plays the risk associated with an oil spill in ice. Current clean up methods are not sufficient when ice cover is > 30%. While oil spill response is highlighted as an important requirement for exploration and production in the Labrador Shelf Area the lack of adequate technology for this purpose is not addressed.

Climate change is and will continue to have major consequences for the both the environment and the ecosystem of the Labrador Shelf. The document must include a section on anticipated changes, the potential effects on exploration and production of oil and gas on the Shelf as well as the changes in risk scenarios that may result (due to changes to ice conditions or severe weather event frequency or magnitude for example). The document should also consider the cumulative effects of climate change and oil and gas related activities on the VECs selected for this assessment.

Specific concerns:

The rationale for VEC selection should be included in the document.

Water chemistry/water quality is not identified as a specific VEC but should be included as part of the description of the environment and potential effects should be discussed as part of the fish habitat VEC.

P42 2.5.3 The first sentence is incorrect. It implies that produced water is only seawater. The second sentence is correct.

Radioactivity of produced water is a significant concern for certain formations – for example, produced water is now the largest source of radioisotopes to the North Sea however there is considerable uncertainty about the exact numbers as most countries do not require reporting on discharges of radioactivity (Betti et al, 2004). Inorganic and organic nutrient enrichment from produced waters can be considerable and may have significant consequences on the marine foodweb (Rivkin et al. 2001). Both Radioisotopes and nutrient enrichment should be included in the discussion.

P 47 Last ¶ While the practices and technologies that will be used in the Labrador Sea area may be the same as elsewhere around the world, this is not the case for the environmental conditions. This very important assumption underlies the use of accident and risk statistics from other offshore oil producing regions. There are a number of oil producing regions subject to extreme weather conditions and ice. These should be used for risk analysis and comparison purposes.

Table 29 NRC 2002 is not referenced – is this NRC 2003?

Section 2.6 Accidental events due to severe weather are ignored in this section. Many serious accidents to rigs (<http://www.oilrigdisasters.co.uk/>) were caused by storms or other severe weather events.

P54 The calculation of blow out frequency does not make sense. Why average 4 temporally overlapping frequencies and then reduce by 50%? If blow out frequencies for older data are not relevant for today's operating conditions then they should be omitted and only data for relevant time periods used. The rationale for the time period selected (i.e regulatory and technological relevance) should be provided.

Differences between blow out frequency for exploration vs development wells should be discussed.

P66 2.6.8.2 Oil spilled within pack or drift ice. Where is the documentation to support this section? Is it just speculation or is there data available to back up these contentions?

P75 This section should include a discussion of the lack of capability to clean up spills in > 30% ice cover and the effectiveness of cleanup capabilities in ice < 30%.

P77 The proposed ice management schemes are very energy intensive. What is the cost of such an approach in terms of fuel used per volume of oil retrieved?

P100 Subsidence and bank edge slips are not considered in the section on geological hazards. Do they occur in the Labrador Shelf Area? If so where, how often and what are the potential consequences?

P130 The categories proposed for ceiling and visibility ratings do not make sense. Is this a typo?

P140 Speed of ice movement should be presented in the same units in table and text.

P152-153 The shallow draft of ice islands also allows them to drift into much shallower water than the big bergs. The areas of risk of movement and grounding on the banks of the Shelf will therefore be different for ice islands. This should be addressed in the document.

P156 How are these means calculated? Are all profiles used and if so is the number obtained weighted by the number of profiles per scour? or are there the same number of profiles for each scour? How is the standard deviation calculated? for each score or with all profiles? If the latter this is not a correct calculation since the profiles for each score are not independent samples.

P162 Tab. 3.50 Sub heading for column 6 should read "effective pit diameter".

Questions about the calculation of mean and standard deviation raised above should be addressed for these calculations too.

P 189 4.3.2 Highly productive kelp beds are found scattered throughout the coastal archipelago anywhere sheltered from ice scour by irregular bathymetry. These make a significant contribution to primary production in the coastal areas of the Labrador Shelf. The sessile community have been documented qualitatively (see Petro Canada 1982) but have not been assessed quantitatively. This should be identified as a data gap.

P189 4.3.3.1 This is a very poor summary of the pelagic system of the Labrador shelf. It demonstrates a lack of understanding of the ecology of primary production. This section should be rewritten and adequately documented. Much of the existing literature is ignored.

Bacteria, ice algae and microzooplankton are ignored as is the role of heterotrophic production. The contribution of aquatic macrophytes and freshwater inputs of organic matter to primary production of the Shelf is ignored. There is no discussion of the influence of the many rivers draining onto the shelf.

P195 4.3.3.2 This section is also very poor. Conclusions are drawn from references pertaining to areas outside the Labrador Shelf (Breeze et al = Scotian Shelf). References are incomplete (Drinkwater and Harding?)

4.3.4 Also very poor. None of the relevant literature appears to have been referenced. There are in fact quite a number of studies directly relevant to the benthos of the Labrador Shelf (for example: Gagnon and Haedrich, 1991; Barrie et al. 1980; Carey 1991; Stewart et al 1985).

4.3.5 The references provided in this section are for the Gulf of St. Lawrence.

P222 4.6.3 The seal section in the Offshore Labrador Initial Environmental Assessment (Petro Canada, 1982) is much better referenced and written than these sections.

P223 Why are maps from 1969-1987 included here without update?

P243 Fig. 4.31, 4.32 X axis labels are missing.

P 345 If OWTG (2002) are to be reviewed every 5 years then this was due last year. What is the status of the review and the guidelines?

5.2.2 What is the NL experience with drill cuttings? Why are only model results discussed? Observations of drill waste dispersion and deposition should be included in this section as well as a discussion of how well the models work.

P351 5.2.10 Why is reinjection not included as a possible mitigation?

- P352-3 Produced water: This section is missing several important items:
- impacts on primary and secondary production
 - radioisotopes
 - changes to redox chemistry upon release and consequences for availability of contaminants

P354 The density of the produced water will also depend on the salinity of the formation.

P355 Produced water discharges increase with the age of a well. The White Rose EEM report referred to is too early in the production life of the project to expect impacts from produced water.

Why is reinjection omitted from the list of possible mitigations?

P 357 Several of the spill trajectories in easterly winds overlap the moulting grounds for harlequin ducks. The consequences should be discussed.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

G. Mabrouk, Aquaculture Section

May 7, 2008

On behalf of the aquaculture group, myself, Dr. Reid and Dr. Hamoutene have looked at the report and we came to a consensus. As indicated in the report, there are no aquaculture activities presently in that area. There may be some future possibilities of Arctic Char or wolffish culture, but likely very limited. There have been a few small scale hatcheries of Arctic Char established recently in some Northern First Nations Communities (might be Quebec). One of the promises of wolffish is their low temperature tolerance, so that might be a good candidate. However, we expect it may be a while before we see any of these in cages (as oppose to hatchery rearing for stocking) off the coast of Labrador anytime soon. Even if this does occur we expect the scale would be very small. Open Ocean Aquaculture may also be a long way off in that area as well, since you still need easy access to an established fish feed distribution net work for such a large operation to be viable.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

G. Maillet, Physical and Biological Oceanography

May 15, 2008

I reviewed the "very" brief section on "Plankton". The scientific studies cited in the SEA-LSOA are quite dated and lack more recent data collected on behalf of Fisheries and Oceans (Atlantic Zone Monitoring Program - http://www.meds-sdmm.dfo-mpo.gc.ca/zmp/main_zmp_e.html). No information is presented in the SEA-LSOA on potential environmental impacts on the lower trophic levels from exploration and production activities. Instead, the environmental assessment focuses on the upper trophic levels such as commercial fish/invertebrate species and marine mammals which are clearly dependent on the lower trophic levels as a prey source.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

J. Morgan, Groundfish Section

May 14, 2008

Included below are some comments on the above referenced SEA.

4.2.1 COSEWIC Species Atlantic cod

The northern cod stock does not extend from 2G to 3L but rather that area encompasses two stocks 2GH and northern cod (2J3KL).

'The extent of migration between the inshore and offshore stocks of 2J3KL is not well understood'. This should probably be the 'current extent'.

'Tagging experiments have shown that the Northern cod stock is relatively isolated from adjacent stocks in divisions 2J3KL, 4TVn, and 3Ps.'

Since 2J3KL is the northern cod stock I don't understand this statement. If this is referring to the cod stock in 2GH then it should be called 2GH. More recent tagging by Bratney (many CSAS documents) has shown the at least the inshore portion of northern cod area has regular migrations from 3Ps.

'Despite its commercial and ecological importance, the spawning behavior of Atlantic cod is poorly understood. Spawning has rarely been observed in the field. Recent studies have shown that successful reproduction involved complex behaviour between the sexes.' In fact the spawning behaviour of cod was well described by Brawn in the 1960's.

4.4 Fish

Scallops, crabs, shrimp, whelks are not fish.

4.4.5 American plaice

'Females do not reach sexual maturing until they are 11 years of age (40 to 45 cm).' Current age at sexual maturity for females in the area (2+3K) is around 8 years with a length of maturity of about 30 cm. Busby et al. CSAS 2007.

4.4.6 Greenland halibut

The references on spawning are out of date and more up to date sources should be used which show that spawning areas are not as clearly defined as suggested in the text.

4.9 Commercial fisheries

4.9.2 Historical overview

Fig. 4.3.1 4.3.2 and table 4.9 do not seem to match. Fig. 4.3.1 seems to indicate a total of about 100 000 t of catch in the last few years (foreign + domestic) while Fig 4.3.2 indicates less than 60 000 t. Table 4.9 gives 135 000 t for the domestic harvest alone.

Also the foreign catch in recent years seems very high. Is this Irminger sea redfish (I think it could only be part of it)? If it is should it be included? I can't really tell from the figures but it looks like the extent of the area is Canada's 200 mile limit. If it is then fish taken outside the limit should not be included and Irminger Sea redfish would be included in that category. The authors should be sure of their numbers before releasing a document that indicates 40 000 t of foreign catch in 2GHJ in recent years.

The labels on the axes of the graphs need to be legible.

4.9.3.1 Atlantic cod

Given that the area of interest is the offshore I don't see the utility of including a lot of inshore information, especially from the central inshore portion of the northern cod area which is not only inshore but south of the area of interest.

There seems to have been little attempt to find information on cod in 2GH. More information on this stock needs to be included. A good recent source is Smedbol et al. 2002 CSAS 2002/82.

4.9.3.7 Greenland halibut

'Eventually, the fishery moved further offshore to the sentential slopes (Brodie et al. 2007).' This should probably be 'continental slopes'.

'Although a TAC (Figure 4.76) is established for this resource, estimated catches have been exceeded by 27 percent, 22 percent and 27 percent respectively for the first three years of the rebuilding plan (Healey et al. 2007).' Should be 'estimated catches have exceeded the TAC by..'.
'

'The temporal coverage of Divisions 2GH has been irregular, with no surveys being conducted in 2G since 1999 (Healey 2007).' Should be the 'temporal coverage of research surveys'. The authors can not just lift things directly from other sources without making some adjustments if they expect people to understand the text.

5.1.2 Marine Fish

5.1.2.1 Invertebrates

Invertebrates are not fish, marine or otherwise.

5.10 Planning implications

5.10.7 Planning Implications for Fish and Fisheries

I am not sure that all of the spawning times given in table 5.7 (referenced as 5.6 in the text) are correct. Especially for Greenland halibut.

More recent literature should be examined for spawning times of this species.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

J. Wheeler, Pelagics Section

May 15, 2008

Report was reviewed by the Pelagic Section. There were no comments.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

Jack Lawson, Marine Mammals Section

May 9, 2008

While this document provides a Strategic Environmental Assessment of potential exploration and production activities that could occur in the Labrador Shelf Offshore Area, I felt some issues still need to be addressed, and the authors could have gone further in suggesting mitigation and monitoring tasks.

One of my continuing complaints is the continued assertion that only SARA-listed marine mammal species be considered when determining the need and types of monitoring and mitigation processes. I think this is short-sighted on the part of the C-NLOPB as the status of quite a few marine mammal species in our waters have yet to be assessed by COSEWIC, and mitigation measures for a SARA-listed marine mammal are likely just as relevant to those that have yet to be listed.

Specific comments:

P. 28 – the statement “A study by the US Naval Research Laboratory done in 1972 showed that ambient noise levels in the sea were 87 dB... Studies of ambient noise worldwide have shown a 3 dB rise in levels per decade that would bring the levels to approximately 96 dB.” Needs to be clarified. What studies? Where was the recorded level equal to 87 dB, and in what conditions? This does not necessarily relate to levels in the Labrador SEA area in any way.

P. 31 – “A relatively strong infrasonic component approximately 1.5 Hz, corresponding to the rotation rate of the drilling turntable, was measured by Hall and Francine ... however, such low frequencies would attenuate rapidly in water shallower than a few tens of metres and are not transmitted into the water by all caisson rigs.” But how does this apply to offshore rigs in Labrador or in deep water?

P. 174 – another threat to marine mammals is displacement of the animals due to anthropogenic noise

P. 175 – it must be stated that the lack of sightings of fin (or any other marine mammal or sea turtle) in mid- and northern Labrador waters may relate as much to the lack of observer effort as it does to actual distributional differences. The map for fin whales, at least, should state this.

P. 212 – killer whales ARE sighted regularly in the northwest Atlantic. A recent summary includes a preliminary abundance estimate and descriptions of distribution that includes the project SEA. Lawson et al. 2007. Killer whales of Atlantic Canada, with

particular reference to the Newfoundland and Labrador Region. DFO, Research Document 2007/062. Available at <http://www.dfo-mpo.gc.ca/csas/>

P. 362 – oil spills could also indirectly effect the health of marine mammals through ingestion, ingestion of contaminated prey, or a by reduction in available prey through the prey's death. For example, this may be the cause of the decline of the Alaskan killer whale population following the Exxon Valdez oil spill.

P. 390 – As I suggested at the outset, I think that seismic airgun array shut downs should be applicable to more marine mammals than just those SARA-listed species.

P. 390 – I think the authors should include more detail on the “Marine Mammal and Seabird Observation program”. I have offered to train these observers in the past, and they can offer far better data collection and mitigation through training and a clear and detailed plan for their activities.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

M. Simpson, Marine Fish Species at Risk Section

May 15, 2008

The Marine Fish Species at Risk Section reviewed the relevant section of the report that pertained to their area of expertise. No comments were provided.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

E. Colbourne, Physical and Biological Oceanography

May 15, 2008

The following sections were reviewed:

3.6 Ice Conditions	131
3.6.1 Sea Ice Occurrence and Concentration.....	131

General

Figures 3.34 to 3.48 are of poor quality and almost impossible to read, especially when printed. For example, I cannot read the contour labeling on Fig 3.40 or Fig 3.43 among others. In addition the overall plots look blurry.

Specific Points

In the summary on page 132 the first point should have contour maps of the day of first presence, last presence and duration in days.

The second point is misleading. In the north the number of weeks of ice presence is 1 week in the offshore areas to 28 weeks near shore not 1 to 28 weeks in the north and similarly for the southern regions.

Figure 3.35 and 3.36 are not necessary, they could give the impression that ice is present year around, the plots by month should be sufficient.

Figure 3.47 according to the Environment Canada Sea-Ice atlas indicates sea ice is present in Lake Melville in late November.

3.6.2 Sea Ice Drift.....	140
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It would be useful to express some of the numbers in knots or nautical miles per day

3.6.3 Pack Ice Floe Size Data.....	141
3.6.4 Sea Ice Thickness Data.....	141
3.6.5 Multi-year Ice	143

3.7 Iceberg Occurrence.....	145
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Figure 3.49 what years are included?

Top of page 147 the number should be $1 \times 10^{-4} \text{ km}^{-2}$ not $1 \times 10^{-4} / \text{km}^{-2}$

3.7.1 Iceberg Drift.....	147
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At the beginning of this section should read...Contact frequency with structures is directly related to iceberg drift speed.....

3.7.2 Iceberg Size.....	149
3.7.2.1 2006 Survey Program.....	150
3.7.2.2 Iceberg Physical Dimensions Study	150
3.7.2.3 Icebergs Observed During Drilling Operations	150
3.7.2.4 Voisey's Bay Iceberg Survey	150
3.7.2.5 International Ice Patrol Surveys	150

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

D. Power, Groundfish Section

May 16, 2008

Included below are some comments on the above referenced SEA.

Section 4.1.2.1 Wolffish

The footnote on Figs. 4.1, 4.2, 4.3: “*Note: Darker shades denote greater distribution*”.....Likely the darker shading denotes greater density.

Page 171 (pdf page 196) notes the following “*Though not as great as the other species, the Atlantic wolffish (or the striped wolffish) has also declined in population and distribution (see Figure 4.3).*.....clarification required on what “*Though not as great*” means.

Section 4.1.2.2 Blue Wales

The following statement: “*The global blue whale population is estimated at 5,000 to 12,000 individuals; although to date, there are no reliable estimates*”.....First there is no reference provided for these estimates, and second, what is meant by the last part (underlined)?

Section 4.2.1 Atlantic cod

Page 183 (pdf page 208) notes the following:

“*The northern cod stock is distributed east off Newfoundland and Labrador’s east coast from Subdivision 2G to Subdivision 3L (DFO 2007b).*”.....2G should be 2J...2GH is considered a separate stock.

“*Tagging experiments have shown that the Northern cod stock is relatively isolated from adjacent stocks in divisions 2J3KL, 4TVn, and 3Ps.*”remove 2J3KL as this is the northern cod stock.

“*However, the stock does occasionally mix in the Northwest Gulf with 4TVn cod, and in the Strait of Belle Isle with 2J3KL cod (Yvelin et al. 2005).*”The stock referred to here is from the perspective of the Northern Gulf stock (4RS3Pn), therefore replace 2J3KL cod with 4RS3pn cod...this latter stock is referred to as the Northern Gulf cod stock.

Section 4.4.4 Redfish

Page 208 (pdf page 233) notes the following term when referring to the reproductive biology: "...*icethotropic viviparous*...".....I've never heard of the term *icethotropic* but perhaps the term lecithotrophic was intended (larvae feeding exclusively on energy stored in the yolk)?

Section 4.4.6 Greenland halibut

In general, there has been much research on Greenland halibut biology subsequent to the most recent references contained in this section (1988).

Page 211 (pdf page 236). "*Notes the following: Spawning occurs in deep warm waters of the Davis Strait.*"This is quite a dated statement. The following is taken from Fishery Bulletin, July, 2002, by Jesper Boje: "*The spawning grounds of Greenland halibut are believed to be located southwest of Iceland (Sigurdsson1) and cover an extended area from Davis Strait, south of 67[degrees]N (Jensen, 1935; Smidt, 1969) to south of Flemish Pass off Newfoundland (Junquera and Zamarro, 1994) between 800 and 2000 m depths.*" In addition see Morgan et al (MS 2001). Comparative Analyses of Greenland Halibut (*Reinhardtius hippoglossoides*) Maturation for Populations Throughout the North Atlantic. NAFO SCR Doc 01/116 Ser. No. N4504 and references therein.

Section 4.4.9 Rock Cod

Page 215 (pdf page 240) The scientific name for Rock cod is *Gadus ogac* not *Lotella rhacina*. The latter is in the Family Moridae as opposed to *Gadus ogac* which is in the Family Gadidae.

Section 4.9.2 Historical Overview

Page 243 (pdf page 268). With respect to Figure 4.31 (NAFO catches 2GHJ, All countries + Canada Only, 1960-2005).....The x-axis scale is missing but the graph suggests there were foreign catches within the 2GHJ Divisions in the latter period in the order of 45,000-60,000 t. This is not correct and the values in this figure needs to be checked because the only foreign effort in 2GHJ since 1994 has been outside the 200-mile limit and the only species caught there is redfish, but the level of such catches is not in the order 45,000-60,000 t. The graph says 1960-2005 but in the text notes the period is 1985-2005.

Figure 4.32 shows a similar trend to Fig. 4.31 but a smoothed line is used, yet a much different scale is used (largest catch in graph is about 120,000 t...largest in Fig. 4.3.1 is over 180,000 t). A better explanation of the differences between Fig. 4.31 and 4.32 should be provided. It is also not clear what source was used in Fig. 4.31 but the text indicates for Fig 4.32 "...Catches for NAFO-regulated species by foreign and domestic harvesters, based on NAFO statistics, are shown in Figure 4.32."

Table 4.9 suggests the average total domestic catch from 2004-2006 is about 136,000 t. This is not consistent with the most recent values in Fig. 4.31 and 4.32

Section 4.9.7.4 Witch Founder

Page 303 (pdf page 328). The statement “...*Age data from fishery and DFO surveys have not be collected since 1994.....*” This statement is not accurate in regard to the DFO survey – aging material (otoliths) has been collected annually since 1994 but have not been aged due to a lack of technical expertise.

Section 4.9.7.5 Greenland Halibut

Page 303 (pdf page 328). The statement “...*Abundance and biomass estimates carried out in both spring and autumn multi-species surveys have been sporadic, especially in Divisions 2GH.*” Is not correct...This should read: “...they have been sporadic in Divisions 2GH, especially in Division 2G.

Other comments:

Check for spelling of Atlantic cod (*Gadus morhua*...not *morhue*)

Check for spelling of Atlantic (striped) wolffish (*Anarhichas lupus*...not *lumpus*)

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

G. Han, Physical and Biological Oceanography

May 16, 2008

Comments on Section 3.2 to 3.4

Page 106, Line 1-3: The description on the seasonal SST change is confusing. It should be reworded.

3.4.4 Current: The Labrador Current has significant interannual and longer-term variability, in response to climate variability and change. A discussion of knowledge regarding the interannual and decadal variability of the Labrador Current should be included. See for example, Han, 2005, Continental Shelf Research; Hakkinen and Rhines, 2004, Science; Han and Tang, 1999, Journal of Physical Oceanography.

There is a significant onshore current south of Hamilton Bank, which is not represented in Figure 3.25.

Page 118, 1st paragraph. The description needs improvement. Readers have to guess Fig. 3.26 is from “the previous Labrador Sea model”. If the model physics is similar, how can the new model improve the result over the Labrador Shelf? By imply including the Scotian Shelf and the Gulf of St. Lawrence?

In terms of the seasonal and spatial variability of the Labrador Shelf circulation, the report could include a more detailed and better illustration either based on the BIO model, or on a finite element model developed for the PERD project by DFO Newfoundland.

Table 3.23: Definitions for Column 7 and 8 are not clear. My guess is they are mean velocity magnitude and mean velocity direction, respectively.

What does steadiness mean in Table 3.23? Is it necessary to be included?

What about current meter data after 1980? For example, DFO collected multi-year current meter data during 1985 to 1987 (Lazier and Wright, 1993, Journal of Physical Oceanography).

Line 122: It is impossible for the K_1 tidal currents to be “3.1 to 2.5 m/s”.

Change “M2” to “ M_2 ”, “S2” to “ S_2 ”, “K1” to “ K_1 ” and “O1” to “ O_1 ”.

Table 3.24: Major and Minor axes have a unit of cm/s, but Inc. has a unit of degree.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

J. Helbig, Physical and Biological Oceanography

May 16, 2008

Comments on Sections 3.2, and 3.5

The legend in Figure 3.32 appears to be reversed implying that the region has very low visibility throughout the year.

Other than that, these sections are acceptable.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

D. Taylor, Shellfish Section

May 16, 2008

Included below are some comments on the above referenced SEA.

1. Overall, the document is not very well written, and does not cite pertinent recent publications that should be referenced in support of statements regarding biological data. It should really be reviewed thoroughly by a competent professional(s) familiar with the scientific literature and fishery data. Perhaps this would get rid of a lot of the unnecessary repetition that is evident.
2. Fig. 4.33: presents a pie chart showing the percent of the Labrador landings constituted by snow crab. This appears to be a percent of landed weight rather than value which under represents the importance of snow crab in Labrador.
3. Table 5.7: the table which reports "spawning" period for crab provides no references and probably represents the minimum period for larval hatching and/or egg extrusion that this population demonstrates.
4. It may be worth while to calculate average snow crab landings from the bid parcels where exploration is proposed.

The report appears to be an exhaustive but superficial study.

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Review of the Labrador Shelf Strategic Environmental Assessment (SEA) Draft Report

D. Orr, Shellfish Section

May 16, 2008

Included below are some comments on Section 4.4.3 Northern Shrimp pertaining to the above referenced SEA.

Northern or pink shrimp (Pandalus borealis) distributions in the Northwest Atlantic range from the Davis..... If spp. is used, then the author must include all species which would include more than just the northern or pink shrimp. Note insert *borealis*.

They occupy shallow inshore waters to depths of 180 m..... This is not true. The bulk of the commercial fishery takes place in waters ranging from 200 – 500 m. The fishery takes place well offshore; however, females do migrate into shallower cooler water during spring

Eggs (1,700 for the average female) are laid in the summer..... This is probably a little low. According to FAO Fisheries Synopsis No. 144 the average female (Carapace length = 28 mm) should carry approx. 2400 eggs.

As with most crustacea, northern shrimp grow by moulting their shells. During this period, the new shell is soft, causing them to be highly vulnerable to predators such as Greenland halibut (turbot), cod (DFO 2006c), Atlantic halibut, skates, wolffish and harp seals (Phoca groenlandica) (DFO 2000b). They will be vulnerable to predators regardless of whether they have a soft shell.

During collection of traditional knowledge (Nain 2007; Makkovik 2007) and at public consultations (Nain 2007; Natuashish 2007; Hopedale 2007; Happy Valley-Goose Bay 2007; Mary's Harbour 2007; Port Hope Simpson 2007) it was indicate that northern shrimp were fished within the Labrador Shelf SEA Area. The areas in which northern fish may be fished included areas between Makkovik and Hopedale (Nain 2007; Natuashish 2007; Hopedale 2007; Happy Valley-Goose Bay 2007; Mary's Harbour 2007; Port Hope Simpson 2007). They are fished along the coast of Labrador and off Northeastern Newfoundland. Attached is a map of the 2007 fishing areas.



Shrimp fishing areas
4-6 with ...

Dave Orr, Shellfish Section
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De: Meade, James
Envoyé: June-06-08 11:43 AM
À: English, Ambrose C; King, Wayne; Penney, Kim; Coughlan, Geoff; Morgan, Joanne; Han, Guoqi; Power, Don; Lawson, Jack; Sjare, Becky; Stansbury, Don; Wheeler, John; Simpson, Mark R; Payne, Jerry F; Helbig, James; Gilkinson, Kent; Mabrouk, Gehan; Colbourne, Eugene; Gregory, Robert; Anderson, M. Robin; Maillet, Gary; Orr, David
Cc: Richards, Dale E
Objet: Lab Shelf SEA
Pièces jointes: Labrador Shelf SEA - DFO Comments June 5 2008.doc

Good Morning Everyone,
Please find attached the completed DFO review of the Labrador Shelf SEA document.
Thank you all for your comments and contribution to the review of this document - your cooperation is greatly appreciated.
Enjoy the weekend!

Cheers,
Jim

James Meade

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Your File Votre référence

Our File Notre référence
BAB 3970-635

6 June 2008

Ms. Kimberly A. Coady
Environmental Assessment Officer
Canada-Newfoundland and Labrador Offshore Petroleum Board
5th Floor, TD Place
140 Water Street
St. John's NL A1C 6H6

Dear Ms. Coady:

Subject: Labrador Shelf Strategic Environmental Assessment - Review of Draft Two Report

Fisheries and Oceans Canada (DFO) has conducted a review of the document entitled, "*Draft Two Report: Strategic Environmental Assessment, Labrador Shelf Offshore Area*" and offers the following comments for your review and consideration.

General Comments

The description of the existing biological environment appears to be deficient. In particular, Section 4.3, which should contain the general biological framework of the ecosystem is lacking in rigor and documentation. The description of the lower food web demonstrates a lack of understanding regarding the fundamental processes and ecological dynamics supporting primary and secondary production on the Labrador Shelf. The sections on plankton are poorly written as well as generally deficient. The microbial web is omitted completely. Contributions to primary production by ice algae, macroalgae and seagrasses are also missing.

s.19(1)

In a number of places throughout the document, the authors note that information is lacking about the biology and ecology of the Labrador Shelf Area. While much remains to be learned, there is a long history of biological studies in the region. It should be noted that a lot of this information has not been referenced in this document. The authors [REDACTED] have omitted reference to most of the relevant literature. Much of this literature was reviewed in the "Offshore Labrador Initial Environmental Assessment" (Petro Canada 1982) and in the detailed studies of the Offshore Labrador Biological Studies (OLABS) Program. An update of this material since that time should be included in this document.

In the case of marine mammal species where specific SEA regional data (and in many cases, any data at all) are lacking, general biological information from other parts of their range as well as

Canada

'global' or 'northern hemisphere' abundance information is provided. This information is important, but should not overshadow or deflect attention away from the fact that little is known about the species in the SEA region. A lot of the marine mammal species descriptions are taken from COSEWIC documents, which are somewhat general by nature; hence some of the information does not reflect the biology, migratory behavior and social behavior of the species in Newfoundland and Labrador waters. When available, key original references and regionally specific information should be presented. To reiterate, when there is a paucity of data, it should be more clearly noted, rather than adding information that is not really relevant to the area.

- s.21(1)(b) Ice as a habitat is not mentioned in the document. The ice algae community is not discussed and its contribution to primary production is ignored. Ice as habitat for marine mammals is not discussed either. As a result, the consequences of an oil spill in ice are not addressed in this context. The document also down plays the risk associated with an oil spill in ice. Current clean-up methods are not sufficient when ice cover is > 30%. While oil spill response is highlighted as an important requirement for exploration and production in the Labrador Shelf Area, the lack of adequate technology for this purpose is not addressed.

Assessment of the risks associated with oil and gas exploration and production in the Labrador Shelf Area are based on the assumption that accident and spill data from temperate regions around the world adequately reflect the level of risk of such developments on the Labrador Shelf. While the regulatory regime and technologies may be similar, this is not the case for environmental conditions. More appropriate comparison groups would be the Grand Banks, Beaufort Sea or Sakhalin Island where ice conditions and severe weather might be assumed to be similar as a first basis for comparison. The importance of failing to meet this basic assumption in selection of a comparison group is clear when the oil spill statistics for the Grand Banks are compared with those from the US Outer Continental Shelf (OSC) or the North Sea when calculating associated risks. According to the data presented in Section 2.6.5, spills are orders of magnitude more frequent on the Grand Banks than elsewhere. This is a concern. Arctic environmental conditions should be taken into consideration in these calculations.

For future reference and clarification, Transport Canada is the Lead Agency for ship safety, Response Organizations (Eastern Canada Response Corporation (ECRC) in NL), the 60 Oil Handling Facilities (OPEP- Oil Pollution Emergency Plans), and the shipboard oil pollution emergency plans (SOPEP's) for tankers over 150 tonnes and all ships over 400 tonnes. After an oil pollution incident has occurred or is about to occur, then the Canadian Coast Guard-Environmental Response becomes the Lead Agency responsible for ensuring an adequate response.

There is no acknowledgement or recognition of the importance of climate variability and climate change on both the environment and the ecosystem of the Labrador Shelf. The document should include a section on anticipated changes, potential effects on exploration and production of oil and gas on the Labrador Shelf as well as the changes in risk scenarios that may result (due to changes in ice conditions or severe weather event frequency or magnitude, for example). There are regional models becoming available which provide our first 'look' forward at what conditions may be like over the next 25 to 50 years. This is relevant information that should be taken into consideration throughout the SEA document.

There is no mention of the large scale ecosystem changes that have occurred in the NW Atlantic since the mid-1980s. In the historical overview section, the graphics clearly show how the industry has radically changed and yet there is no ecological framework provided. These large scale changes should be appropriately indicated for all the species that are discussed, particularly the ones that are considered 'keystone' such as capelin and Arctic cod (which are not even included in the document). This concern has been raised previously and should be addressed in this document.

The primary focus on commercial fish species somewhat compromises the intent of a SEA, since some ecologically important species may not have been included. This is particularly evident with the omission of Arctic cod, which is a 'keystone' species that should be included.

Specific Comments

Pg. 26, Emergency Response. It is important to understand how the Canadian Oil Spill Response Regime is set up. There are Response Organizations in place in Canada, but their main focus is on land-based Oil Handling Facilities (OHF) and ships of a specified size. Although Response Organizations (more specifically ECRC in NL) have had, and continue to have, arrangements/contracts with offshore operators, they are not required by any legislation to enter into these contracts.

Through its Environmental Response program, the Canadian Coast Guard (CCG-ER) is responsible for ensuring the cleanup of ship-sourced spills of oil and other pollutants into Canadian waters. This includes: monitoring clean-up efforts by polluters; and managing cleanup efforts when polluters are unknown, unwilling or unable to respond to a marine pollution incident. The objectives of the Environmental Response (ER) program of the Canadian Coast Guard are: to minimize the environmental, economic and public safety impacts of marine pollution incidents; and provide humanitarian aid to natural or manmade disasters. The Canadian Coast Guard maintains a level of its own preparedness capacity, monitors and investigates all reports of marine pollution incidents and ensures an appropriate response to all marine pollution incidents in waters under Canadian jurisdiction.

Transport Canada is the lead federal regulatory agency responsible for Canada's Marine Oil Spill Preparedness and Response Regime, which was established in 1995 and is built on a partnership between government and industry. Within the framework of the regime, Transport Canada sets the guidelines and regulatory structure for the preparedness and response to marine oil spills. Transport Canada ensures that the appropriate level of preparedness is available to respond to marine oil pollution incidents in Canada of up to 10,000 tonnes within prescribed time standards and operating environments. The Regime is built on the principle of cascading resources, which means that in the event of a spill, the resources of a specific area can be supplemented with those from other regions (geographic areas) or from international partners, as needed.

Pg. 28, Para. 3. The following statement "*A study by the US Naval Research Laboratory done in 1972 showed that ambient noise levels in the sea were 87 dB... Studies of ambient noise worldwide have shown a 3 dB rise in levels per decade that would bring the levels to approximately 96 dB*" needs to be clarified. What studies? Where was the recorded level equal

to 87 dB, and under what conditions? It should be noted that this may not necessarily relate to levels in the Labrador SEA area.

Pg. 29, Table 2.3. Cetacean species as listed are fine; however, pinnipeds also communicate acoustically and can be masked by industrial noise. This is particularly the case for bearded seals and, to a lesser degree, ringed seals. Cases could also be made for hooded and harp seals at certain times of the year.

-Bearded and ringed should also be listed in the table (and generally considered/included in all subsequent sections of related text).

Pg. 31, Para. 2. *"A relatively strong infrasonic component approximately 1.5 Hz, corresponding to the rotation rate of the drilling turntable, was measured by Hall and Francine ... however, such low frequencies would attenuate rapidly in water shallower than a few tens of metres and are not transmitted into the water by all caisson rigs."* Please explain how this applies to offshore rigs in Labrador or in deep water.

Pg. 42, Produced Water. The first sentence is incorrect. It implies that produced water is only seawater.

-Radioactivity of produced water is a significant concern for certain formations. For example, produced water is now the largest source of radioisotopes to the North Sea; however, there is considerable uncertainty about the exact numbers as most countries do not require reporting on discharges of radioactivity (Betti *et al.*, 2004). Inorganic and organic nutrient enrichment from produced waters can be considerable and may have significant consequences on the marine foodweb (Rivkin *et al.* 2001). Both Radioisotopes and nutrient enrichment should be included in the discussion.

Pg. 46, Accidental Events. Throughout this section various worldwide statistics are referenced and compared to operations on the East coast where there hasn't been any large scale spills. CCG-ER believes that exploration/production operations should be fully self-sufficient in responding to the small scale releases, which make up the majority of the releases. The entire Canadian Oil Spill Response regime could be used for any large scale releases, which are very rare. This would ensure a response to the smaller spills, which sometimes get ignored when industry compares the small impact to that of a large release worldwide. Having a large container outfitted with one very large skimmer system designed for the 1 in 100 year release isn't practical for the smaller releases, which are much more frequent.

- Time is extremely important when responding as well and CCG-ER believes that this response equipment should be on site during exploration and production

- Accidental events due to severe weather are ignored in this section. Many serious accidents to rigs (<http://www.oilrigdisasters.co.uk/>) were caused by storms or other severe weather events

- While the practices and technologies that will be used in the Labrador Sea area may be the same as elsewhere around the world, this is not the case for the environmental conditions. This very important assumption underlies the use of accident and risk statistics from other

offshore oil producing regions. There are a number of oil producing regions subject to extreme weather conditions and ice. These should be used for risk analysis and comparison purposes.

Pg. 47, Table 29. NRC 2002 is not in the reference list.

Pg. 54, Para. 1. The calculation of blowout frequency does not make sense. It is unclear why 4 temporally overlapping frequencies were averaged and then reduced by 50%? If blow out frequencies for older data are not relevant for today's operating conditions, then they should be omitted and only data for relevant time periods used. The rationale for the time period selected (i.e., regulatory and technological relevance) should be provided.

Pg. 64, Behaviour of Oil Spilled in Water. Some of the natural processes that effect oil when spilled act differently when the same oil is spilled in, on or around ice. Oil will remain persistent for longer periods and will resist dispersion and evaporation. There should be a better understanding of response strategies for responding to oil in ice, especially if production or exploration will occur throughout the ice season in Labrador.

-CCG-ER would like to see the most advanced response equipment designed for oil in ice to be stationed along the Labrador Coast or on the rig themselves. The regular response equipment will not be satisfactory for most of the year.

Pg. 66, Oil Spilled Within Pack or Drift Ice. Supporting documentation/references are needed for this section. For instance, is it just speculation or is data available to back up these statements?

Pg. 75, Spill Modeling and Response Planning. This section should include a discussion of the lack of capability to clean up spills in >30% ice cover and the effectiveness of cleanup capabilities in ice < 30%.

Pg. 100, Para. 1. Subsidence and bank edge slips are not considered in the section on geological hazards. Do they occur in the Labrador Shelf Area? If so where, how often and what are the potential consequences?

Pg. 104, Figure 3.18, and Pg. 105, Figure 3.19. There should be some georeferencing provided on these maps.

Pg. 106, Para.1. The description on the seasonal sea surface temperature (SST) change is confusing and should be re written.

Pg. 117, Current. The Labrador Current has significant interannual and longer-term variability in response to climate variability and change. A discussion of knowledge regarding the interannual and decadal variability of the Labrador Current should be included. See for example, Han, 2005; Hakkinen and Rhines, 2004; Han and Tang, 1999.

-In terms of the seasonal and spatial variability of the Labrador Shelf circulation, the document should include a more detailed and better illustration either based on the BIO model, or on a finite element model developed for the PERD project by DFO Newfoundland.

Pg. 117, Fig. 3.25. There is a significant onshore current south of Hamilton Bank, which is not represented in the figure.

Pg. 118, Para. 1. The description needs improvement. Readers have to guess that Fig. 3.26 is from “the previous Labrador Sea model”. If the model physics is similar, how can the new model improve the result over the Labrador Shelf? By including the Scotian Shelf and the Gulf of St. Lawrence?

Pg. 120, Table 3.23. Definitions for Column 7 and 8 are not clear. Are they mean velocity magnitude and mean velocity direction, respectively?

Pg. 120, Table 3.23. What does steadiness mean? Does it need to be included?

Pg. 121, Para. 1. What about current meter data after 1980? For example, DFO collected multi-year current meter data during 1985 to 1987 (Lazier and Wright, 1993)

Pg. 122, Tides. It is impossible for the K_1 tidal currents to be “3.1 to 2.5 m/s”. Please revisit and revise.

-Change “M2” to “ M_2 ”, “S2” to “ S_2 ”, “K1” to “ K_1 ” and “O1” to “ O_1 ”.

Pg. 122, Table 3.24. Major and Minor axes have a unit of cm/s, but Inc. has a unit of degree.

Pg. 130, Fig. 3.32. The legend appears to be reversed implying that the region has very low visibility throughout the year.

Pg.130, Para. 1. The categories proposed for ceiling and visibility ratings do not make sense. Is this a typo?

Pg. 132, Bullet 1. The document should contain contour maps of the day of first presence, last presence and duration in days.

Pg. 132, Bullet 2. In the north the number of weeks of ice presence is 1 week in the offshore areas to 28 weeks near shore, not 1 to 28 weeks in the north and similarly for the southern regions. The text as written is misleading.

Pg. 132, Figures 3.34 to 3.48. These illustrations are of poor quality and almost impossible to read.

Pg. 133, Figure 3.35 and 3.36. These figures are not necessary and could give the impression that ice is present year around. The plots by month should be sufficient.

Pg. 139, Figure 3.47. According to the Environment Canada Sea-Ice atlas, sea ice is present in Lake Melville in late November.

Pg. 140, Sea Ice Drift. It would be useful to express some of the numbers in knots or nautical miles per day.

-Speed of ice movement should be presented in the same units in table and text. Please ensure consistency.

Pg. 145, Figure 3.49. Which years are included?

Pg. 147, Para.1. Typo: the number should be $1 \times 10^{-4} \text{ km}^{-2}$ not $1 \times 10^{-4} / \text{km}^{-2}$

Pg. 147, Iceberg Drift. The beginning of this section should read: "...*Contact frequency with structures is directly related to iceberg drift speed...*"

Pg. 152, Ice Islands. The shallow draft of ice islands also allows them to drift into much shallower water than the larger icebergs. The areas of risk of movement and grounding on the banks of the Shelf will therefore be different for ice islands. This should be addressed in the document.

Pg. 167. The first paragraph contains several grammatical and typographical errors.

Pg. 169, Para. 4. The last sentence is internally inconsistent. Please revise for clarity.

Pg. 171, Para. 3. Explain what is meant by the phrase 'Though not as great as' in the following statement "*Though not as great as the other species, the Atlantic wolffish (or the striped wolffish) has also declined in population and distribution (see Figure 4.3).*"

Pg. 172, Para. 4. There is no reference provided for the following statement "*The global blue whale population is estimated at 5,000 to 12,000 individuals; although to date, there are no reliable estimates*". Explain what is meant by the underlined part of this statement.

-As written the opening text of the section ('blue whales are found globally') does not appropriately emphasize the serious situation which blue whales of the northern hemisphere are in.

-Compared to text on the fin whale, the blue whale information is less detailed and vague; general life history information is missing.

-To complete the list of projected related stressors listed (e.g. ship collisions) in the last paragraph of the text; disturbance due to industry-related underwater noise should also be included.

Pg. 174, Para 2. All scientific names should be italicized.

Pg. 174, Para 2. Another threat to blue whales (and all marine mammals in general) is displacement of the animals due to anthropogenic noise

Pg. 175, Para. 4. It should be stated that the lack of sightings of fin (or any other marine mammal or sea turtle) in mid- and northern Labrador waters may relate as much to the lack of observer effort as it does to actual distributional differences. The map for fin whales (Figure 4.5) should at least state this.

Pg. 183, Table 4.2 and Section 4.2.1. The correct spelling is *Gadus morhua*, not *morhue*.

Pg. 183, Table 4.2. Please delete western Hudson Bay from the range/population designation column (this population is not endangered) and correct its' status.

-Walrus should be added to the table since the Arctic population is listed as threatened and walrus observed along the Labrador coast, primarily in the pack-ice zone, are from this population. Ensure related walrus information is inserted in text.

-Given that it is not certain whether the beluga along the Labrador coast are from the eastern Hudson Bay stock, the listings of the Cumberland Sound and eastern Arctic populations should also be included in the table.

Pg. 183, Para. 1. The northern cod stock does not extend from 2G to 3L, but rather that area encompasses two stocks 2GH and northern cod (2J3KL).

Pg. 183, Para. 2. "*The extent of migration between the inshore and offshore stocks of 2J3KL is not well understood.*" should probably be the 'current extent'.

Pg. 183, Para. 4. The following statement "*Tagging experiments have shown that the Northern cod stock is relatively isolated from adjacent stocks in divisions 2J3KL, 4TVn, and 3Ps*" does not make sense since 2J3KL is the northern cod stock. If this is referring to the cod stock in 2GH, then it should be called 2GH. More recent tagging by Bratney (many CSAS documents) has shown the at least the inshore portion of northern cod area has regular migrations from 3Ps.

Pg. 183, Para. 4. "*However, the stock does occasionally mix in the Northwest Gulf with 4TVn cod, and in the Strait of Belle Isle with 2J3KL cod (Yvelin et al. 2005).*"The stock referred to here is from the perspective of the Northern Gulf stock (4RS3Pn), therefore replace 2J3KL cod with 4RS3pn cod...this latter stock is referred to as the Northern Gulf cod stock..

Pg. 183, Para. 5. "*Despite its commercial and ecological importance, the spawning behavior of Atlantic cod is poorly understood. Spawning has rarely been observed in the field. Recent studies have shown that successful reproduction involved complex behaviour between the sexes.*" In fact the spawning behaviour of cod was well described in the 1960's (Brawn, 1961a,b).

Pg. 183, Section 4.2.1. For Atlantic cod, there is no discussion of juvenile ecology, despite numerous published accounts in the past 15 years – mainly from the northern cod stock described in this document – on feeding, movement, and habitat associations. Omitting this information represents a significant deficiency of this report.

Pg. 185, Beluga Whale. Please check entire document for reference to the Labrador Inuit Association (LIA) and replace with Nunatsiavut Government or other related designation.

-In the sentence referring to the stock affinities of the beluga whales observed in Labrador waters - the eastern Hudson Bay population should be included in addition to the Ungava Bay population. However, it is also possible that there are whales from the Cumberland Sound population, or even Western Hudson Bay. The sentences in question need rewording – check the most current stock status reports for beluga whales on DFO Publication web site.

Pg. 187. Typo: correct Lance to lance.

Pg. 189, Benthic Community. Highly productive kelp beds are found scattered throughout the coastal archipelago where they are sheltered from ice scour by irregular bathymetry. These make a significant contribution to primary production in the coastal areas of the Labrador Shelf. Although the sessile community has been documented qualitatively (see Petro Canada 1982), it has not been assessed quantitatively. This should be identified as a data gap.

Pg. 189, Plankton. The scientific studies cited are quite dated and the document lacks more recent data collected on behalf of Fisheries and Oceans (Atlantic Zone Monitoring Program - http://www.meds-sdmm.dfo-mpo.gc.ca/zmp/main_zmp_e.html). There is no information presented on potential environmental impacts of exploration and production activities on the lower trophic levels, but rather it focuses on the upper trophic levels such as commercial fish/invertebrate species and marine mammals, which are clearly dependent on the lower trophic levels as a prey source

Pg. 189, Phytoplankton. This is a poor summary of the pelagic system of the Labrador shelf and demonstrates a general lack of understanding of the ecology of primary production. This section should be rewritten and adequately documented as much of the existing literature is ignored.

-Bacteria, ice algae and microzooplankton are ignored as is the role of heterotrophic production. The contribution of aquatic macrophytes and freshwater inputs of organic matter to primary production of the Shelf is ignored. There is no discussion of the influence of the many rivers draining onto the shelf.

Pg. 195, Zooplankton. This section is also poorly written. Conclusions are drawn from references pertaining to areas outside the Labrador Shelf (Breeze *et al.* = Scotian Shelf) and references are incomplete (Drinkwater and Harding).

Pg. 195, Benthic Invertebrates. This section is poorly written. None of the relevant literature appears to have been referenced. There are in fact quite a number of studies directly relevant to the benthos of the Labrador Shelf (e.g., Gagnon and Haedrich, 1991; Barrie *et al.* 1980; Carey 1991; Stewart *et al.* 1985).

Pg. 195, Intertidal Community. The references provided in this section are for the Gulf of St. Lawrence.

Pg. 207, Para. 5. "*Northern or pink shrimp (Pandalus borealis) distributions in the Northwest Atlantic range from the Davis...*" If spp. is used, then the author should include all species, which would include more than just the northern or pink shrimp. Note insert *borealis*.

Pg. 207, Para. 5. the following statement "*They occupy shallow inshore waters to depths of 180 m...*" is not accurate. The bulk of the commercial fishery takes place in waters ranging from 200 – 500 m. The fishery takes place well offshore; however, females do migrate into shallower cooler water during spring

Pg. 207, Para. 5. “Eggs (1,700 for the average female) are laid in the summer...” This is probably a little low. According to FAO Fisheries Synopsis No. 144 the average female (Carapace length = 28 mm) should carry approx. 2400 eggs.

Pg. 207, Para. 6. “As with most crustacea, northern shrimp grow by moulting their shells. During this period, the new shell is soft, causing them to be highly vulnerable to predators such as Greenland halibut (turbot), cod (DFO 2006c), Atlantic halibut, skates, wolffish and harp seals (*Phoca groenlandica*) (DFO 2000b).” The authors should note they will be vulnerable to these predators regardless of whether they have a soft shell.

Pg. 207, Para. 7. “During collection of traditional knowledge (Nain 2007; Makkovik 2007) and at public consultations (Nain 2007; Natuashish 2007; Hopedale 2007; Happy Valley-Goose Bay 2007; Mary’s Harbour 2007; Port Hope Simpson 2007) it was indicate that northern shrimp were fished within the Labrador Shelf SEA Area. The areas in which northern fish may be fished included areas between Makkovik and Hopedale (Nain 2007; Natuashish 2007; Hopedale 2007; Happy Valley-Goose Bay 2007; Mary’s Harbour 2007; Port Hope Simpson 2007).” They are fished along the coast of Labrador and off Northeastern Newfoundland. Please see the map of the 2007 fishing areas attached.

Pg. 208, Para. 5. “Redfish are icethotropic viviparous...” Please define the term icethotropic as it has not been encountered by the reviewers.

Pg. 210, Para. 4. “Females do not reach sexual maturing until they are 11 years of age (40 to 45 cm).” According to Busby *et al.* 2007., current age at sexual maturity for females in the area (2+3K) is around 8 years with a length of maturity of about 30 cm.

Pg. 211, Para. 2. “Spawning occurs in deep warm waters of the Davis Strait.”This is a dated statement. The following is taken from Fishery Bulletin in July, 2002, by Jesper Boje: “The spawning grounds of Greenland halibut are believed to be located southwest of Iceland (Sigurdsson1) and cover an extended area from Davis Strait, south of 67[degrees]N (Jensen, 1935; Smidt, 1969) to south of Flemish Pass off Newfoundland (Junquera and Zamarro, 1994) between 800 and 2000 m depths.” In addition see Morgan *et al.* (2001) and references therein.

Pg. 212, Para. 2. Killer whales are sighted regularly in the northwest Atlantic. A recent summary by Lawson *et al.* (2007) includes a preliminary abundance estimate and descriptions of distribution that includes the project SEA.

Pg. 215, Para. 3. The scientific name for Rock cod is *Gadus ogac*, not *Lotella rhacina*. The latter is in the Family Moridae as opposed to *Gadus ogac*, which is in the Family Gadidae.

- There is no discussion of juvenile rock cod ecology, despite several published accounts in the past decade on movement and habitat associations of this lifestage. As it is the most habitat-restricted of the life-stages, this is a significant omission.

Pg. 219, Sei Whale. The reference for evidence of two stocks should be provided.

Pg. 219, Bowhead. The statement “No live bowheads for a century. . . .” needs to be put into proper context. There have been several sightings in Newfoundland waters in more recent years,

suggesting whales still occasionally use the area; these references should be included. There is a high likelihood that the species uses the northern areas of SEA region and this should also be reflected.

Pg. 223, Figure 4.25. This figure should be deleted because it is based on so little data. Furthermore, it is not representative of any of the species. In fact, it leaves the reader with an incorrect perspective of seal distribution.

Pg. 223, Harbour Seals. The last two sentences of the first paragraph should be reworded as they incorrectly leave the impression that harbour seal pups do not go into the water until after the weaning period.

Pg. 224, Harp Seals. Update population estimates and references (2004 survey information is available on DFO web site).

- Check the sentence that indicates '*Atlantic cod*' comprises 54% of the harp seal diet - it should probably be '*Arctic cod*' or there is some other mistake or missing contextual information. Regardless, the sentence is an over simplification and provides an inaccurate perception of harp seal diet given the annual, seasonal, geographic and age class variations that exist.

- Change the sentence "...*harp seals are expected to be common in the SEA region...*" to "*are common in the SEA region.*"

- It should be noted that in most years a substantial proportion of the harp seals pupping in Newfoundland and Labrador waters do so in the southern portion of the SEA region. This has implication for the impact assessment of oil spills and possibly other industry-related activities.

- There is minimal TEK information provided for this species. Brice-Bennett (1977) is cited. There needs to be more detailed information provided regarding current subsistence use and evolving commercial use. The Nunatsiavut Government has plans to become more actively involved in encouraging increased participation the harp seal commercial hunt.

Pg. 224, Hooded Seals. There are new 2004 population estimates available for this population on the DFO web site.

- As in the case with harp seals, in most years a substantial proportion of the hooded seals pupping in Newfoundland and Labrador waters do so in the southern portion of the SEA region. This information should be added to the text.

Pg. 224, Bearded Seals. All scientific names should be italicized.

- The following statement "*Seasonal movements are directly related to sea ice...*" should be reworded. Along the Labrador coast, some bearded seals remain in coastal waters during the summer and may not follow the receding ice northward. As written the above sentence is an over simplification which gives an incorrect impression of the ecology and movement patterns of the species for the SEA region.

-Including information on weights, lengths and body condition deviates from the format used for other seal species. Similar information exists for them as well. Please revisit and add complimentary information for the other species.

-TEK information is missing.

Pg. 225, Grey Seals. Reword the sentence pertaining to grey seal distribution from “...grey seals will likely be present...” to “grey seals are present in the SEA region...”

Pg. 226, Ringed Seal. Reword and add additional information regarding the sentence: ‘no compelling evidence that ringed seals undertake co-ordinated seasonal migrations.’ The meaning of this sentence is unclear because ‘co-ordinated’ is not defined. Nor is it clear what comparisons are being made. More emphasis should be placed on the variable nature of the movement patterns that have been documented: some animals do not move, while others move relatively short distances (within 100-300 miles) and still others move several thousand miles. As written, the sentence and related text does not accurately reflect the movement behavior of this species in general and it does not provide information that is more specific to the coast of Labrador.

Pg. 227, Marine Mammal and Turtle Data Gaps. This section outlines the general areas where data gaps exist; however, it should be made clear that even for species that are relatively well studied in parts of their range – *little is known about what occurs in Labrador waters*. This point tends to get lost in the generalities.

Pg. 243, Historical Overview. The document discusses the distinction between historical fisheries along the Labrador coast as being primarily a groundfish fishery and the present fishery, which is dominated by shellfish (shrimp and crab). Although the present fishery is dominated by shellfish, any future EA documents for this area should consider appropriate mitigations for historical groundfish fisheries species, as it is possible that these fisheries could return to the Labrador coast in the near future. Some recoveries of groundfish and pelagic species have already been observed in the area. Capelin and cod, for instance are returning to the Labrador coast.

Pg. 243, Capelin. Given the importance of capelin in the SEA region, this section should be revised with more regional specific information and references. This section also needs a discussion of long term changes in the resource (i.e., effects of ecosystem change and impact of future climate change).

-Some rewording is required to ensure that the reader is not left with the impression that capelin may spawn in early June in coastal Labrador as this is not the case.

Pg 243-245. There appears to be some inconsistencies among Figures 4.3.1 and 4.3.2 and Table 4.9. Fig. 4.3.1 seems to indicate a total of about 100 000 t of catch in the last few years (foreign + domestic), while Fig 4.3.2 indicates less than 60 000 t. Table 4.9 reports 135 000 t for the domestic harvest alone.

Pg. 243, Fig. 4.31 (NAFO catches 2GHJ, All countries + Canada Only, 1960-2005). The x-axis scale is missing, but the graph suggests there were foreign catches within the 2GHJ Divisions in

the latter period in the order of 45,000-60,000 t. This is incorrect and the values in this figure need to be checked because the only foreign effort in 2GHJ since 1994 occurred outside the 200-mile limit and the only species caught was redfish; however, the level of such catches is not in the order of 45,000-60,000 t. Although the graph illustrates that catches occurred between 1960-2005, the text notes the period as 1985-2005.

Pg. 244, Fig. 4.32. This figure shows a similar trend to Fig. 4.31 but a smoothed line is displayed even though a very different scale is used (largest catch in graph is about 120,000t and largest in Fig. 4.3.1 is over 180,000t). A better explanation of the differences between Fig. 4.31 and 4.32 should be provided. Also, it is not clear which source is used for Fig. 4.31, since the text indicates for Fig 4.32 “...Catches for NAFO-regulated species by foreign and domestic harvesters, based on NAFO statistics, are shown in Figure 4.32.”

Pg. 244, Fig. 4.33. This appears to be percent of landed weight rather than value, which underestimates the importance of snow crab in Labrador.

Pg. 253, Atlantic cod. More information is required on cod in 2GH. A good recent source is Smedbol *et al.* (2002).

Pg. 284, Para. 1. “*Eventually, the fishery moved further offshore to the sentential slopes (Brodie et al. 2007).*” Should this read ‘continental slopes’?

Pg. 284, Para 3. The following statement “*Although a TAC (Figure 4.76) is established for this resource, estimated catches have been exceeded by 27 %, 22 % and 27 %, respectively for the first three years of the rebuilding plan (Healey et al. 2007)*” should state ‘estimated catches have exceeded the TAC by...’

Pg. 284, Para. 4. The following statement “*The temporal coverage of Divisions 2GH has been irregular, with no surveys being conducted in 2G since 1999 (Healey 2007)*” should read the ‘temporal coverage of research surveys’.

Pg. 290, Para. 3. “*Within the Labrador Shelf SEA Area, Arctic char have been harvested from exclusively from NAFO Unit Area2H.*” While commercial harvesting of Arctic Char occurs in 2H, Arctic Char is harvested for subsistent purposes along the entire Labrador coast. For example, there are significant harvests of Arctic char in the Sandwich Bay and Black Tickle areas.

Pg. 302, Table 5.7. Please provide references for the spawning times reported in Table 5.7 (referenced as 5.6 in the text).

Pg. 303, Witch Founder. The statement “*Age data from fishery and DFO surveys have not be collected since 1994...*” is not accurate in regard to the DFO survey as aging material (otoliths) have been collected annually since 1994, but have not been aged due to a lack of technical expertise.

Pg. 303, Greenland Halibut. The statement “*Abundance and biomass estimates carried out in both spring and autumn multi-species surveys have been sporadic, especially in Divisions 2GH*” is not correct. This should read: “...surveys have been sporadic in Divisions 2GH, especially in Division 2G.

Pg. 303, Regulatory Framework. This section lists and outlines the mandates for key Acts – e.g. the *Marine Mammal Act* and the *Fisheries Act*. However, the *Oceans Act* and *Species at Risk Act* have not been included.

Pg 303, Sensitive Areas and Pg. 317 Data Gaps for Sensitive Areas. There are no sensitive areas for marine mammals mentioned and this is primarily because so little is known. This point needs to be reflected and emphasized in the text. There is a significant amount of evidence that indicates areas important for marine birds are also likely important for a variety of marine mammal species (and there are some sensitive sea bird areas identified in the text).

Pg. 308, Hawke Channel-Hamilton Bank. Although the Sensitive Areas section was updated to include a reference to Hawke Channel-Hamilton Bank area, the figures were not updated to reflect the change and still focus on the channel. The conclusion regarding sensitive areas hasn't been updated either and only lists the channel. This could lead to some confusion for the public.

- DFO notes that the authors have not explained the development/formation Hawke Channel Box adequately, as was previously requested

Pg. 345, Para. 4. If the Offshore Waste Treatment Guidelines (OWTG 2002) are supposed to be reviewed every 5 years, this would have been due last year (2007). What is the current status of the guidelines and the review?

Pg. 345, Newfoundland Experience. What is the NL experience with drill cuttings? Why are only model results discussed? Observations of drill waste dispersion and deposition should be included in this section as well as a discussion of how well the models work.

Pg. 351 and Pg. 355. Mitigations. Why is reinjection not included as a possible mitigation?

Pg. 352, Produced Water. This section is missing several important items: impacts on primary and secondary production; radioisotopes; and changes to redox chemistry upon release and consequences for availability of contaminants.

Pg. 354, Para. 7. The density of the produced water will also depend on the salinity of the formation.

Pg. 355, Commercial Fisheries. Produced water discharges increase with the age of a well. The White Rose EEM report referenced is too early in the production life of the project to expect impacts from produced water.

Pg. 362, Para 6. Oil spills could also indirectly effect the health of marine mammals through ingestion, ingestion of contaminated prey, or by a reduction in available prey resulting from prey mortality. For example, this may be the cause of the decline of the Alaskan killer whale population following the Exxon Valdez oil spill.

Pg. 366, Oil Spills. This section demonstrates a good knowledge of the effects that an oil spill may have on the sensitive areas along the shoreline. Obviously, prevention and preparedness are key. Having Emergency Response Plans in place with the appropriate response equipment to

accompany the plan as well as the staff to operate the equipment is also critical when taking into account the remoteness of most of the area.

Pg. 367, Marine Transportation. Although MCTS only tracks vessels over 500 tonnes, the Canadian Oil Spill Response Regime captures tankers over 150 tonnes and all vessels over 400 tonnes that carry oil as fuel or cargo. These vessels are all required to have SOPEP's. This is regulated by Transport Canada's Marine Safety. Each community (or OHF) that has fuel oil offloaded or loaded should have an OPEP. Included in the plan should be a list of response equipment that should be present when the transfer is taking place as well as a declaration stating that the OHF has an arrangement with a certified Response Organization.

Pg. 378, Para. 3. CCG-ER supports the idea of operators considering the value of maintaining onsite spill response equipment with locally trained responders.

Pg. 382, Table 5.7. DFO previously highlighted that a table listing spawning times had incorrect information for the *SARA* listed wolffish species. Table 4.16. - The table states that wolffish spawn from December to February, but on page 173 it notes northern wolffish spawn in late fall early winter and spotted and Atlantic wolffish spawn between July to October. The table should be updated to reflect that larger timing window for wolffish spawning, particularly as these are *SARA* species. This table is now Table 5.7 on pg.382, but it hasn't been updated.

Pg. 388, Planning Considerations. Spill response capability along the Labrador Coast needs to be upgraded to support any activities that may be undertaken in the area. The appropriate equipment with locally trained people should be in place.

Pg. 390, Bullet 7. Seismic airgun array shut downs should be applicable to marine mammals other than those identified as *SARA*-listed species.

Pg. 390, Bullet 8. The authors should provide more detail on the "Marine Mammal and Seabird Observation program". DFO personnel (J. Lawson) has offered to train these observers in the past, and they can offer far better data collection and mitigation through training and a clear and detailed plan for their activities.

Pg. 391, Accidental Events. The Oil Spill Response Plan needs to be exercised on a regular basis. The response times and the response equipment need to be appropriate for the environment and the type of product that is being explored. Prevention equipment should be in place and ready to further mitigate any damages after a spill has occurred.

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Thank you for providing DFO the opportunity to comment on this document. Should you have any questions or comments regarding the above, please contact James Meade by phone at 772-3521 or by e-mail (James.Meade@dfo-mpo.gc.ca)

Yours truly,

Original signed by C. Grant

Carole Grant
Section Head – Habitat Evaluation
Marine Environment and Habitat Management
Oceans and Habitat Management Branch

jm

Attachment

Sooley, Darrin

From: Sooley, Darrin
Sent: June-20-16 2:12 PM
To: [REDACTED] Young, Elizabeth (EYoung@cnlopb.ca)
Subject: Review of Draft Scoping Document Labrador Shelf Offshore SEA Update

Hello [REDACTED] and Elizabeth:

Further to the May 17 meeting of the Labrador Shelf SEA Update Working Group and your May 19 and June 15 email requesting review of the Draft Scoping Document for the Strategic Environmental Assessment Update Labrador Shelf Offshore Area. The following comments on the Draft Scoping Document are offered for your consideration and review:

s.19(1)

- Section 3.0 Area of Focus (page 3) – the planned extension of the SEA Area seaward of the 200 mile EEZ will result in a new area of focus that was not included in the 2008 Labrador Shelf SEA. For the most part information collected / published by DFO – e.g. scientific and stock assessments, species (e.g. fish, invertebrates, marine mammals) distributions, Species at Risk, ecologically significant areas), commercial fishing effort – is focused on areas inside of the 200 mile EEZ. It should be noted that other sources besides DFO may be important with respect to data and information to be used to describe the various marine resources within the portion of the area of focus outside of the 200 mile EEZ.
- Section 5.0 Objectives (page 5) – It should be noted the SEA Update – e.g. overview of the existing environment, description of potential effects, description of mitigations and sensitive areas - will be based on new and relevant information that has become available since the publication of the 2008 SEA.
- Section 5.0 (page 5) Identify knowledge and data gaps (8th bullet) - this bullet should also include reference to updating the status of knowledge and data gaps identified in the 2008 SEA.
- Section 5.0 (page 3) Identify Areas of interest or sensitive areas (11th bullet) – this bullet should note that there have been a number of Ecologically and Biologically Sensitive Areas (EBSA) identified within the Newfoundland and Labrador Shelves Bioregion which includes areas (2G/2H/2J) that are located within the Labrador Shelf SEA Update area.
- Section 7.2 Factors and Issues to be Considered (page 8), Section 7.2.2 (page 10) and Section 7.2.3 (page 10-12) – as noted earlier the description of the physical and biological environments and the components of same within the update area should be based on existing data / information that has become available since publication of the 2008 Labrador Shelf SEA rather than a rehash / repackaging of information from the 2008 SEA.
- Section 7.2.3 Biological Environment (4th Bullet Finfish and Marine Invertebrates page 10) – information to support this description may be available within DFO Stock Assessment and other publications that have been published / completed since 2007 / 2008.
- Section 7.2.3 Biological Environment (5th Bullet Commercial, Recreational and Aboriginal Fisheries page 11) – as noted previously for areas outside of the 200 mile EEZ data from sources other than DFO may be important when describing existing and historic commercial fisheries.
- Section 7.2.3 Biological Environment (9th Bullet Species at Risk page 11) – it should be noted that the most recent and up to date information available for *Species at Risk Act* related species information (e.g. species status, species listings, species recovery planning, species critical habitat designations) is provided for within the Species at Risk registry (www.sararegistry.gc.ca).

- Section 7.2.3 Biological Environment (12th Bullet Sensitive/Special Areas page 11) – As noted earlier the description of sensitive or special areas in the SEA update area should make reference to the EBSA that have been identified within the 2G/2H/2J portions of the Newfoundland and Labrador Shelves Bioregion and described within the publication “*Identification of Additional Ecologically and Biologically Significant Areas (EBSAS) within the Newfoundland and Labrador Shelves Bioregion. Can. Sci. Adv. Sec. Science Advisory Report 2013/048*”. This document describes 10 EBSAs that occur within the 2G/2H/2J portions of the SEA Update area (within the 200 mile EEZ).
- Section 7.2.4 Project – Environment Interactions (page 12-13) – It should be noted that this section of the SEA Update will be based on new and relevant information that has become available since the publication of the 2008 SEA.
- Section 7.2.4 Project – Environment Interactions (3rd Bullet page 13) – the discussion of operational discharges and the effects on water and sediment quality should include reference to information and experience that has been gathered from ongoing Environmental Effects Monitoring (EEM) programs for existing Newfoundland and Labrador Offshore Oil and Gas developments including Hibernia, Terra Nova and White Rose.

If any questions or if anything further required please let me know.

Regards,

Darrin R. Sooley

Senior Biologist – Coastal, Marine Oil & Gas Development
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Sooley, Darrin

From: Sooley, Darrin
Sent: February-03-17 11:19 AM
To: 'Young, Elizabeth'; [REDACTED]
Subject: RE: Labrador SEA Update Review of January 24 2017 Draft Scoping Document & WG TOR

PATH SAPH NO: 15-HNFL-00621

s.19(1)

Hello Elizabeth and [REDACTED]:

Further to your January 27, 2017 email please note that I have reviewed the revised (January 24, 2017) Draft Scoping Document and offer the following comments which for the most part are a reiteration of similar comments provided June 20, 2016 on review of the May 2016 draft of the Scoping Document:

- Section 3.0 Area of Focus (page 5) – with respect to the extension of the southern boundary of the SEA Area seaward of the 200 mile EEZ it should be noted that in addition to information published by DFO (e.g. stock assessments, species distribution, species at risk, ecologically sensitive areas, commercial fishing data) other sources of data and information will also be important to describe marine resources within the southern SEA area that is outside of the 200 mile EEZ.
- Section 7.2.3 Biological Environment (2nd (Benthic Invertebrates) and 3rd (Finfish and Marine Invertebrates) bullets page 13) – should indicate that information to support this description may be available within DFO Stock Assessment and other scientific publications that have been published / completed since 2007 / 2008.
- Section 7.2.3 Biological Environment (4th Bullet Commercial, Recreational and Aboriginal Fisheries page 13-14) – as noted above it should be noted that information and data that may be available from sources other than DFO may be important when describing historical / present / potential fisheries for areas of the southern SEA outside of the 200 mile EEZ.
- Section 7.2.3 Biological Environment (9th Bullet Sensitive/Special Areas page 15) - the publication "*Identification of Additional Ecologically and Biologically Significant Areas (EBSAS) within the Newfoundland and Labrador Shelves Bioregion. Can. Sci. Adv. Sec. Science Advisory Report 2013/048*" will be particularly relevant to the description of ecologically and biologically significant areas within the SEA Update area.

If any questions or if anything further required please let me know.

Regards,

Darrin R. Sooley

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From: Young, Elizabeth [mailto:EYoung@cnlopb.ca]

Sent: January-24-17 5:19 PM

To: Annette Tobin; [REDACTED] Sooley, Darrin; [REDACTED] Francine Mercier; Fred Allen; [REDACTED] Glenn Troke; [REDACTED] Jason Flanagan; Marie Clement; [REDACTED] Paul MacDonald; [REDACTED] Robyn Morris; [REDACTED]

Cc: [REDACTED] 'Preston, Melissa (NRCan/RNCan)'

s.15(1)

Subject: Labrador SEA Update Draft Scoping Document & WG TOR

s.19(1)

Good Afternoon,

Thank you for your comments on the draft *Scoping Document* and draft *Working Group Terms of Reference*. We have reviewed all the comments and revised the documents taking into consideration the comments received.

Please note that the eastern boundary of the SEA Update Area has changed since the first draft. As in the first draft, the southern portion of the eastern boundary has been extended beyond the original 2008 Labrador SEA limit to the full extent of Canada's continental shelf claim beyond 200 nautical miles from the territorial sea baselines. The area beyond the 200 nautical mile limit is part of Canada's 2013 partial submission to the Commission for the Limits of the Continental shelf (CLCS). However, upon advice from governments, the northern portion of the eastern boundary now extends only to the 200 nautical mile limit, [REDACTED]

Both revised documents are attached in both track-changes and "clean" formats for your consideration and review. I ask that you provide any comments you may have to me and [REDACTED] by February 6, 2017.

Our apologies for the extended delay in providing the revised documents, much of which was occupied with discussions with governments concerning the changes to the Study Area. If you have any questions or concerns related to the revised Study Area or the extended delay in this process, please do not hesitate to bring those forward.

The next step in the process will be to make the draft Scoping Document available for a four-week period of public review and comment. Following close of the comment period we will provide copies of received comments to the Working Group for review and schedule a meeting and/or conference call to discuss their disposition.

Please do not hesitate to contact us if you have any questions.

Regards
Elizabeth

Elizabeth Young
Environmental Assessment Officer
t. 709 778 4232

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Sooley, Darrin

From: Sooley, Darrin
Sent: March-15-17 1:29 PM
To: 'Young, Elizabeth'; [REDACTED]
Subject: RE: Labrador SEA Update May 2016 meeting and Process Elements Table

PATH SAPH NO: 15-HNFL-00621

Hello Elizabeth and Harry:

s.19(1)

Sorry for delay in responding [REDACTED]

[REDACTED] Please note I have reviewed the meeting minutes and the revised process elements table and have no further comments. The minutes seem to reflect discussion during the May 17, 2016 WG meeting and the revised process elements table reflects comments on the first draft of the Table as noted within my June 1, 2016 email.

If anything further required please let me know.

Regards,

Darrin

From: Young, Elizabeth [mailto:EYoung@cnlopb.ca]
Sent: February-16-17 10:55 AM
To: Annette Tobin; [REDACTED] Sooley, Darrin; [REDACTED] Francine Mercier; Fred Allen; [REDACTED] Glenn Troke; [REDACTED] Jason Flanagan; Marie Clement; [REDACTED] Paul MacDonald; [REDACTED] Robyn Morris; [REDACTED]
Cc: [REDACTED] 'Preston, Melissa (NRCan/RNCan)'; [REDACTED]
Subject: Labrador SEA Update

Good Morning

I have attached the draft *Working Group Meeting #1 (May 17, 2016) Notes* and draft *Process Elements Table*. The Process Elements Table was revised based on feedback from the Working Group. Can you please review both documents and provide comments to me and [REDACTED] by March 3, 2017. Again, our apologies for the extended delay in providing the documents.

Regards

Elizabeth

Elizabeth Young
Environmental Assessment Officer
t. 709 778 4232

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Sooley, Darrin

From: Sooley, Darrin
Sent: June-02-17 11:14 AM
To: 'Young, Elizabeth'; [REDACTED]
Subject: RE: Labrador SEA Update

s.19(1)

PATH SAPH NO: 15-HNFL-00621

Hello Elizabeth and [REDACTED]

Further to your May 5, 2017 please note that I reviewed the latest version of the Scoping Document and offer the following comments for consideration in finalizing the Scoping Document:

- Section 3.0 Area of Focus (page 3) – the planned extension of the SEA Area seaward of the 200 mile EEZ will result in a new area of focus that was not included in the 2008 Labrador Shelf SEA. For the most part information collected / published by DFO – e.g. scientific and stock assessments, species (e.g. fish, invertebrates, marine mammals) distributions, Species at Risk, ecologically significant areas), commercial fishing effort – is focused on areas inside of the 200 mile EEZ. It should be noted that other sources besides DFO may be important with respect to data and information to be used to describe the various marine resources within the portion of the area of focus outside of the 200 mile EEZ.
- Section 7.2.3 Biological Environment (4th Bullet page 11) – as noted previously for areas outside of the 200 mile EEZ data from sources other than DFO may be important when describing existing and historic commercial fisheries.
- Section 7.2.3 Biological Environment (9th Bullet Sensitive/Special Areas page 12) – As noted earlier the description of sensitive or special areas in the SEA update area should make reference to the EBSA that have been identified within the 2G/2H/2J portions of the Newfoundland and Labrador Shelves Bioregion and described within the publication "Identification of Additional Ecologically and Biologically Significant Areas (EBSAs) within the Newfoundland and Labrador Shelves Bioregion. Can. Sci. Adv. Sec. Science Advisory Report 2013/048". This document describes 10 EBSAs that occur within the 2G/2H/2J portions of the SEA Update area (within the 200 mile EEZ).

If any questions please let me know.

Regards,

Darrin R. Sooley

Senior Biologist – Coastal, Marine Oil & Gas Development
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From: Young, Elizabeth [mailto:EYoung@cnlopb.ca]

Sent: May-05-17 10:47 AM

To: Annette Tobin; [REDACTED] Sooley, Darrin; Francine Mercier; Fred Allen; [REDACTED] Glenn Troke; [REDACTED] Jason Flanagan; Marie Clement; [REDACTED] Paul MacDonald; [REDACTED] Robyn Morris; [REDACTED]

Cc: [REDACTED] 'Preston, Melissa (NRCan/RNCan)'; [REDACTED]

Subject: Labrador SEA Update

Good Morning

We are moving forward with the Labrador SEA Update by posting the *Strategic Environmental Assessment Update Labrador Shelf Offshore Area Draft Scoping Document* on our website for public comment. The News Release, in English, Inuktitut, and Innu-aimun, along with the draft Scoping Document in English, and the draft Scoping Document Summary in English, Inuktitut, and Innu-aimun will be posted on the C-NLOPB website today Friday, May 5.

A Public Notice will appear in The Telegram on Saturday, May 6 and May 20 and in the Labradorian on Monday, May 8 and May 22.

The public comment period closes on June 2, 2017.

I have attached all the documents for your information. They can also be found later today on the C-NLOPB website at <http://www.cnlopb.ca/sea/labrador.php>. Please do not hesitate to contact me if you have any questions.

Regards
Elizabeth

Elizabeth Young
Environmental Assessment Officer
t. 709 778 4232

twitter @CNLOPB
www.cnlopb.ca

Notice: Effective September 23, 2014, the C-NLOPB has a new URL address www.cnlopb.ca. Please discontinue using www.cnlopb.nl.ca and update your bookmarks and favorites accordingly. C-NLOPB e-mail addresses will also be changed by removing ".nl" and contact lists should be revised as appropriate.

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Title:	Southern Newfoundland Strategic Environmental Assessment		
PATH File No.:	08-HNFL-NA1-00054	Habitat File No.:	BAB 3970-635
Receive Date:	2008/12/15		

Action Date:	2009/01/19	Action ID No.:	7
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DFO responds to C-NLOPB:

From: Meade, James
Sent: Monday, January 19, 2009 1:13 PM
To: 'Coady, Kim'
Cc: Coughlan, Geoff; Grant, Carole
Subject: RE: Southern NL SEA - Comments on draft Scoping document

s.19(1)

Hi Kim,
Here are DFO comments re: draft Scoping document for the Southern NL SEA.

Pg. 4, Figure 1 should be updated to provide more information. It should include the NAFO areas/ divisions, identify the exploration licences and holders of same (key), and identify the "French Corridor."

Pg. 5, Edit objective 4 to: "Describe and evaluate potential environmental effects associated with offshore oil and gas exploration AND PRODUCTION activities" based on the following statement on page 1: "This document describes the scope of a SEA for offshore petroleum exploration AND PRODUCTION related activities in the marine area south of the island of Newfoundland." The description and evaluation can be fairly general considering the text at the bottom of page 2 and top of page 3 re: the difficulty in predicting the nature and scale of production activities. Also, the last paragraph in section 7.0 (pg.6) states production will be addressed generically.

Pg. 6. Spatial Boundary. There should be another figure/ map that illustrates the boundaries of the LSB and Sydney Basin SEAs showing overlap as well as the new area to the east for this (Southern NL) SEA.

Pg 6. The text regarding the SEA area should discuss the method for determining the spatial boundary (eg. 4000m contour chosen for southern boundary, administrative boundaries of NAFO divisions 3P and 3O and NS-NL Laurentian Channel Boundary).

Pg. 7. Bullet 5 should also include marine-based tourism.

Pg. 8. There should be some descriptive text regarding unexploded ordinances as it is unclear what should be expected from a review of this.

Pg. 9. Commercial fish species and Recreational fish species should be replaced with Commercial Fisheries and Recreational Fisheries.

Pg. 11. Sensitive/ Special Areas should also list corals as well as Ecologically and Biologically Significant Areas (EBSA) identified through the Placentia Bay/Grand Banks Integrated Management initiative .

Cheers,

Jim

-----Original Message-----

From: Coady, Kim [<mailto:KCoady@cnlopb.nl.ca>]

Sent: Monday, January 19, 2009 11:20 AM

To: [REDACTED] Carter, Chris; [REDACTED] Francine Mercier;
Fred Allen; Coughlan, Geoff; Glenn Troke; [REDACTED] Jeanette Goulet; Meade, James; [REDACTED]
[REDACTED] Young, Elizabeth





PATH-SAPH

Text Report

Description:

Report Date:

Page 2 of 2

2018/11/27

Title:	Southern Newfoundland Strategic Environmental Assessment		
PATH File No.:	08-HNFL-NA1-00054	Habitat File No.:	BAB 3970-635
		Receive Date:	2008/12/15

Action Date:	2009/01/19	Action ID No.:	7
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Subject: Southern NL SEA - Comments on draft Scoping document

Just a reminder that comments are due this week (preferably by mid-week) for the draft Southern NL SEA scoping document.

Can you send me a quick email indicating when you will be submitting your comments.

Thanks

Kim Coady
Environmental Assessment Officer
Canada-Newfoundland and Labrador Offshore Petroleum Board

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Fisheries
and Oceans

Pêches
et Océans

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Habitat Management

000131



Title: Southern Newfoundland Strategic Environmental Assessment
PATH File No.: 08-HNFL-NA1-00054

Habitat File No.: BAB 3970-635

Receive Date: 2008/12/15

Action Date: 2009/06/24

Action ID No.: 18

DFO responds to C-NLOPB:

From: Meade, James
Sent: Wednesday, June 24, 2009 3:16 PM
To: 'Young, Elizabeth'
Cc: Grant, Carole; Abbott, Melissa H
Subject: RE: Southern NL SEA - Draft One

s.19(1)

Hi Elizabeth,
I've reviewed for "completeness" and the document appears to incorporate the comments DFO has provided on previous SEAs.
The document still requires some minor editing before release for public review (see: numbering in Recreational Fishery section; correct phraseology of HADD Authorization (not approval) is Harmful Alteration, Disruption or Destruction - pg. 252; Figure 1.1 (not x.x) - pg. 327) otherwise I have nothing further to add at this time.
As the SEA boundary overlaps with NAFO area 4VN and 4VS, I will be consulting my colleagues from DFO Maritimes Region for their review of the appropriate sections of the document. Also note that specific comments re:Oceans Act issues/ clarification are forthcoming separately from Melissa Abbott.

Cheers,

Jim

-----Original Message-----

From: Young, Elizabeth [mailto:EYoung@cnlopb.nl.ca]
Sent: Thursday, June 04, 2009 11:35 AM
To: [REDACTED] chrisccarter@gov.nl.ca; [REDACTED]
doug.yurick@pc.gc.ca; glenn.troke@ec.gc.ca; Meade, James; jeanette.goulet@ec.gc.ca;
[REDACTED] Abbott,
Melissa H; patrickshea@gov.nl.ca; [REDACTED]
Cc: [REDACTED]
Subject: Southern NL SEA - Draft One

Good Day All,

Draft One of the Southern NL SEA has been couriered to you today. I have asked for comments on completeness of the report by June 25, 2009.
The technical review of the report will be undertaken on the revised report (Draft Two) that will be available for public comment. Community consultations are ongoing with the last consultation in St. Bride's scheduled for tonight. The Consultation Report (Appendix) will be finalized after all the consultations have been completed and included in Draft Two.

Regards
Elizabeth

Abbott, Melissa H

From: Coughlan, Geoff
Sent: Monday, July 13, 2009 3:53 PM
To: Abbott, Melissa H
Subject: RE: Southern NL SEA - Draft Consultation Report
Attachments: geoffcomments_Southern NL SEA_Draft Final Consultation Report_090710.doc

I added a few more comments related to other references to our LOMA/EBSAs in addition to my meeting with the consultants.

Geoff

-----Original Message-----

From: Abbott, Melissa H
Sent: Monday, July 13, 2009 10:01 AM
To: Coughlan, Geoff
Subject: FW: Southern NL SEA - Draft Consultation Report

Hi Geoff

As you are the one who spoke to the consultant would you mind having a look at how he paraphrased what you guys discussed and let me know what you think?

It is not due until July 31, [REDACTED] could you have a look and let me know by the end of this week so I can send mine and yours comments next week.

Thanks
melissa

s.19(1)

Melissa Abbott
Oceans Biologist
Oceans, Habitat, & Species at Risk
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A1C 5X1

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(F) 709-772-3578

(Email) melissa.abbott@dfo-mpo.gc.ca

-----Original Message-----

From: Young, Elizabeth [mailto:EYoung@cnlopb.nl.ca]
Sent: Monday, July 13, 2009 9:25 AM
To: [REDACTED] chriscarter@gov.nl.ca; [REDACTED] glenn.troke@ec.gc.ca; Meade, James; jeanette.goulet@ec.gc.ca; [REDACTED]
[REDACTED] Abbott, Melissa H; [REDACTED] Francine Mercier
Cc: [REDACTED]
Subject: Southern NL SEA - Draft Consultation Report

Good Day All,

I have received a draft Consultation Report from LGL. Information from this report will be incorporated into Draft Two with the report itself contained in an Appendix of the report. I ask that you review the attached and provide comments to me no later than July 31 in order for LGL to address them before Draft Two has to be finalized.

Please contact me if you have any questions.

Regards
Elizabeth

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Southern Newfoundland SEA: Report On Industry, Agency and Community Consultations

Introduction

Consultations for this Strategic Environmental Assessment (SEA) report were undertaken with relevant agencies and SEA area stakeholder groups during May and June 2009. Meetings were held in Port aux Basques, Burgeo, Marystown, St. Bride's and St. John's. These consultations were organized and coordinated by Canning & Pitt Associates, Inc., with additional assistance from the Mountain Marine Zonal Board, the Schooner Regional Development Board, the Burgeo Town Council and fisher representatives in Burgeo and Marystown.

Information and background data pertaining to the SEA were sent via email to various agency representatives and potential participants prior to face-to-face meetings and/or follow-up telephone interviews.

A representative of the C-NLOPB and a member of LGL's Study Team attended area-level meetings scheduled in various SEA area communities. At each meeting, following general introductions and a short discussion of the purpose of the consultations, the Board's representative, Elizabeth Young, presented an overview outlining the C-NLOPB's role and mandate, the purpose and scope of the SEA process and a review of the various environmental components to be addressed in the SEA Report. Other information provided by the consultants was then presented and reviewed.

Following these presentations, there was a general round-table discussion that included comments and questions from participants concerning various aspects of the SEA process, potential offshore exploration and development activities, and issues and concerns about the fisheries and marine environmental components. All of the comments, questions and issues raised by participants were noted and recorded.

Appendix 1 contains a complete list of the agencies, individuals and groups who participated in the consultation meetings or else received SEA background documents and other related information for their review and comment.

Issues and Concerns

The following sections provide a summary of the topics and issues discussed at each consultation meeting, or with other stakeholders via telephone and/or email communication.

Fisheries and Oceans. DFO representatives/managers provided a detailed description of the department's ongoing LOMA (Large Ocean Management Area (LOMA)) processes, and the various ongoing initiatives and research efforts associated with identifying biologically sensitive or important areas (e.g. an Ecologically and Biologically Significant Areas (EBSAs) within a specific LOMA located within the SEA study area (the Placentia Bay/Grand Banks LOMA).

The consultants asked how the LOMA process might relate to the SEA process; for example, will some of the significant/sensitive areas within a particular LOMA eventually be "off limits" to oil and gas exploration? DFO's Ocean Governance Co-ordinator noted that indeed that may be the outcome in some cases, the LOMA process is in its early stages and specific management measures have not yet been identified for EBSAs. There are a suite of potential management measures that may be established, not just strict protection. It was further suggested that, in a call for bids process, the C-NLOPB should be aware of the ecological or biological significance of EBSAs might decide not to nominate an EBSA area because of its biological or ecological 'sensitivity'. It was also noted that, if a Marine Protected Area (MPA) was designated, there could potentially might well be relevant conditions attached to that MPA vis-a-vis any potential restrictions on oil and gas exploration activities with that area.

In future, then, the presence of an EBSA might be expected to give industry proponents, or the C-NLOPB, a "heads up" about some offshore areas. In other words, although DFO managers cannot yet say with certainty that a particular offshore area would be "off limits" to oil and gas exploration activities, at present the EBSA process at least serves to raise a "red flag" to the industry regarding the significance of any such areas.

Department of Fisheries and Aquaculture (DFA)

DFA was contacted for an update on aquacultural operations in the western portion of the SEA area, i.e. the shoreline area between Grey River and Port aux Basques. Previous consultations (2006) had identified the location of a licenced cod grow-out operation at Venil's Island close to Burgeo. The department's Manager of Aquaculture Licencing and Inspections reports that this site is no longer operative and the licence has lapsed. However he notes that the department has received applications for four salmonids sites in Bay de Vieux, just to the west of Grey River (T. Budgell, pers comm., July 2009).

Port aux Basques - Rose Blanche - Burgeo Fisher Meetings. In 2006, during consultations for the Sydney Basin SEA, fish harvesters operating in various fishing communities between Port aux Basques and Burgeo provided extensive comments about their region's fisheries resources as well as their concerns about future offshore oil exploration activities and potential interactions with their established fisheries.

Meetings for these same fishers were scheduled and advertised as part of the area-level consultations for this SEA report. But, for various reasons, fishers did not attend the meetings in Port aux Basques or Burgeo. However the FFAW's Stewardship Co-ordinator (for western and northern Newfoundland and Labrador) attended both meetings and provided some general comments on the area's fisheries milieu.

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Port aux Basques Meeting. The Port aux Basques area meeting was organized with the assistance of the Marine Mountain Zone Corporation (MMZC), and was well attended by various Corporation Board members representing a range of local groups and agencies.

A number of general questions and comments were raised and discussed following the Study Team's presentation.

With respect to special or sensitive areas or resources within the region, it was noted that a large number of shipwreck sites have been identified, including a heritage wreck just off Isle aux Mort.

It was noted that a Marine Protected Area (MPA) is being considered for the region (in the Burgeo area), and someone asked if that area would be closed to exploration activities while it was being considered for a MPA. Another person asked if oil exploration activities would be detrimental to some of the marine resources within a MPA.

Concern was also raised that if an EBSA is declared this might act as an impediment to the development of the region's oil and gas resources. For example, it was suggested that an oil company might decide not to explore for oil in an EBSA because that area might be closed to oil-related operations in the future. It was also noted that all of these "environmental rules" were not in place when Hibernia was being developed, and that these new regulations, etc., would make it more difficult to get an offshore industry started in this region. There were a few questions about exploration licences, e.g. how many years does a company have before it has to drill a well, and how long might it take to get some oil development activity underway in the region.

The Corporation's Executive Director, who is also a member of the SEA Working Group, noted that she would be reviewing the draft SEA report and distributing copies to various local agencies and stakeholders for their comments.

Burgeo Town Council. Discussions with Council representatives focused on the area's plans for establishing a National Marine Conservation Area (NMCA), and on several concerns fishers have raised regarding the potential negative effects on fisheries resources from previous and future oil and gas exploration activities.

The Mayor explained the situation regarding the proposed NMCA initiative noting many of the same points he raised in previous consultations with the Board (Sydney Basin SEA, 2006), and reported that Council and other local groups have made very little progress on this matter in the past three years. He reiterated that the MCA initiative was launched in 2003 under the auspices of the Burgeo Economic Diversification Board (BEDB), and that the project has the support and endorsement of many local groups and area fishers. If approved, the NMCA would cover a relatively large coastal and inshore zone, approximately from Grand Bruit to Francois out to about 15 km offshore. However, it seems that the project is being held up because the relevant federal and provincial agencies cannot agree how to proceed.

Environment Canada. Agency managers received relevant background information on the SEA process and study research. In response, the agency's EC's Environmental Assessment Coordinator indicated that he and his managers will be reviewing the draft SEA report and providing any written comments to the Board (G. Troke, pers comm., June 2009).

Fish Food and Allied Workers Union (FFAWU) Meeting. Following a presentation by LGL's representative, there was a short discussion of the DFO LOMA process, and the designation of various EBSAs offshore. The FFAW's representative in this process has suggested to DFO that, if the department wants to create a Marine Protected Area, they should establish one within the existing NAFO Coral Protection Zone.

Commenting on the various commercial fish species that LGL had identified as being economically important, it was noted that the economic value and importance of a particular species can vary greatly over time, depending on market conditions, product prices and resource abundance. As such, it was suggested that a 10-year perspective might not be long enough to identify which species are of economic importance to harvesters vis-a-vis future oil and gas exploration activities.

FFAW managers noted that fishers are becoming more and more concerned about the additional costs incurred in having to steam around the existing offshore production facilities located in the Jean d'Arc Basin area. Though it was acknowledged that this matter is not within the geographic scope of the present SEA study, it is nevertheless an issue which will become of greater concern to the fishing industry as exploration activities expand and as more oil fields come into production.

Concern was expressed about the potential negative effects on fisheries resources of seismic activities, and mention was made of fisher reports that seismic survey operations in the Laurentian Channel several years ago drove all of the crab away from established fishing grounds. FFAW managers reiterated their view regarding the need for long-term monitoring to assess any negative effects on fish and fisheries operations. It was also suggested that, during their regular exploration activities, oil companies could help fill data gaps in our knowledge of fisheries resources. For example, ROV operations associated with various exploration activities could be used to gather data to identify spawning areas.

Natural History Society (NHS). Members of the NHS received relevant background information on the SEA process and the SEA environmental assessment report, but have not yet responded with any comments or concerns.

Association of Seafood Producer (ASP)

The consultants met with the Association's Executive Director to review and discuss the SEA process and the fisheries data to be included in the SEA report. The ASP had no major concerns or issues with respect to the proposed SEA Area, and the Executive Director noted that his group always appreciates the opportunity to review and comment on offshore oil and gas activities as they relate to the province's fisheries industry.

As such, OCI has told DFO that, if a MPA is to be declared, it should be within the NAFO-designated Coral Protection Zone (CPZ), since OCI (or its predecessor company FPI) have never been overly dependent on that particular area, though it was noted that OCI continues to fish redfish in the COZ using mid-water trawls which do not come in contact with the coral resources in this zone.

By extension, in light of the above discussion, it is evident that OCI would also prefer that future oil and gas exploration activities avoid having any negative effects on the company's key, important fishing grounds in the offshore areas identified above, i.e. Burgeo Bank, St. Pierre Bank and the Southeast Shelf.

The meeting ended with a brief question from the Corporation's Executive Director concerning ConocoPhillips' plans to drill a well in the Laurentian Sub-Basin. The Corporation wanted to know the date the company needed to do this work in order to meet its lease obligations. It was also noted that area fishers are relatively pleased with the results of the ESRF-funded research undertaken to assess the potential negative effects of seismic operations on monkfish eggs.

St. Bride's Meeting. Together with several other enterprises from this community, fishers attending the meeting take a portion of their annual catch (crab, cod and other groundfish) within the SEA area, e.g. in 3PSF and 3PSn. They noted their concern that eventually, they might be excluded from fishing in the EBSAs that have been identified by DFO. The coral area within 3O is a much better turbot fishing area compared to other 3PS fishing zones where this species is now taken.

They would prefer not to see any exploration activities in the St. Pierre Bank area, and suggest that the Halibut Channel should also be "off limits" to oil activities. They take a significant portion of their crab in this area. Grounds along the edge of the slope are also important areas for monkfish, cod and halibut, and the Easter and Wester Gullies – especially areas where water depths are between 450 – 750 fathoms – are important grounds for these and other 3PS fishers as well.

Conne River Band Council. During preparation of the Sydney Basin SEA report, in 2006, the SEA study team obtained detailed information on the type and location of fish harvesting activities that were under the jurisdiction of the Conne River Band Council ("the Council"). The SEA report presented a detailed description of those fisheries.

In the process of preparing the present SEA report, the consultants contacted the Council's fisheries resource manager for an update on the harvesting activities of Band members. The description prepared for the 2006 SEA report was sent to the Operations Manager for her comment and review. She subsequently reported that there have been no changes in the Band's communal/commercial fisheries operations since 2006 (J. Drake, pers comm., June 2009).

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If a MCA is eventually declared, it remains unclear whether oil and gas exploration activities would be permitted within that area. Another Councilor asked if the designation of a MCA would affect Husky's exploration of its lease area in the Burgeo Bank area.

The Mayor also noted that local fishers remain concerned about the negative effects of oil and gas exploration activities. They have reported that a seismic vessel went through some crab grounds 80 km offshore three years ago and crab have since "disappeared" from that area. A Councilor, who is also a fisher representative, said that fishers report finding a significant increase in the number of lobsters close to shore and claim that offshore seismic operations had "driven these lobsters inshore". He went on to note that the western portion of the St. Pierre Bank is a relatively new crab fishing area, and fishers might be concerned if exploration activities were to take place in that zone. Another person asked if there have been any studies undertaken to assess the potential effects of seismic operations on crab. LGL's biologist responded to this question describing the research his firm had done on the effects of seismic on crab several years ago. Council members suggested that exploration companies should consult with fishers regarding the best time to conduct seismic surveys in this region.

In a final comment, one Council member said that, if any offshore exploration activities do take place in this area, the community would like to see Burgeo used as an onshore supply / service base for those activities.

Marystown Meeting. The Marystown meeting was organized with the assistance of the Schooner Regional Development Corporation. Most of the discussion at this meeting focused on the offshore harvesting activities within the SEA area by vessels operated by Ocean Choice International (OCI). The manager responsible for OCI's fleet spoke about his company's fisheries and how they relate to DFO's LOMA initiative, in particular the potential implications of the departmental identification of EBSAs. OCI's fleet manager, along with other industry agency representatives - e.g. GEAC - is a member of the DFO working group involved in the EBSA process.

Based on discussions within the DFO working group, the fishing industry's view is that DFO's long-term intention is to designate one or more Marine Protected Areas (MPA) and that the identification of EBSAs is an important part of the process of selecting an offshore area as a candidate for a MPA. As such, OCI and GEAC have indicated to the department which area the fishing industry would prefer to see designated as a MPA, if DFO proceeds to establish such an area (or areas).

OCI (and other offshore harvesting firms) would like certain specific offshore areas to be "off limits" for a MPA. These include the St. Pierre Bank area, which is an important cod fishing zone for OCI's fleet, and likewise the Burgeo Bank area which is one of the company's key redfish grounds. OCI has told DFO that the declaration of a MPA on the Southeast Shelf (edge and slope) would result in a closure of the company's Marystown processing facility because that is where the company harvests its yellowtail.

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Ocean Choice International (OCI). OCI's Manager of Fleet Administration and Scheduling attended the Marystown meeting organized by the Schooner Regional Development Corporation. His comments are included in the report of that meeting, as discussed above.

Other Corporate Harvesting Firms and Agencies. Background information on the SEA area and on the SEA environmental assessment process were sent to relevant managers of Clearwater Seafoods Limited Partnership, Icewater Fisheries Ltd., and also to the Groundfish Enterprise Allocation Council. However, to date, none of these groups have responded with any comments or concerns.

Appendix 1. Agencies and Persons Consulted

DFO

Jim Meade, Senior Regional Habitat Biologist

Geoff Coughlain, Oceans Governance Co-ordinator (Oceans Division)

Leon Slaney, Area Chief of Resource Management, Grand Bank Office

Department of Fisheries and Aquaculture (DFA)

Todd Budgell, Manager, Aquaculture Licencing and Inspections (Grand Falls)

Environment Canada

Glenn Troke, Environmental Assessment Coordinator

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Clearwater Seafoods Limited Partnership

[REDACTED]

Icewater Fisheries Ltd.

[REDACTED]

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[REDACTED]

Ocean Choice International (OCI)

[REDACTED]

Association of Seafood Producers

[REDACTED]

Groundfish Enterprise Allocation Council (Ottawa)

[REDACTED]

Conne River Band Council

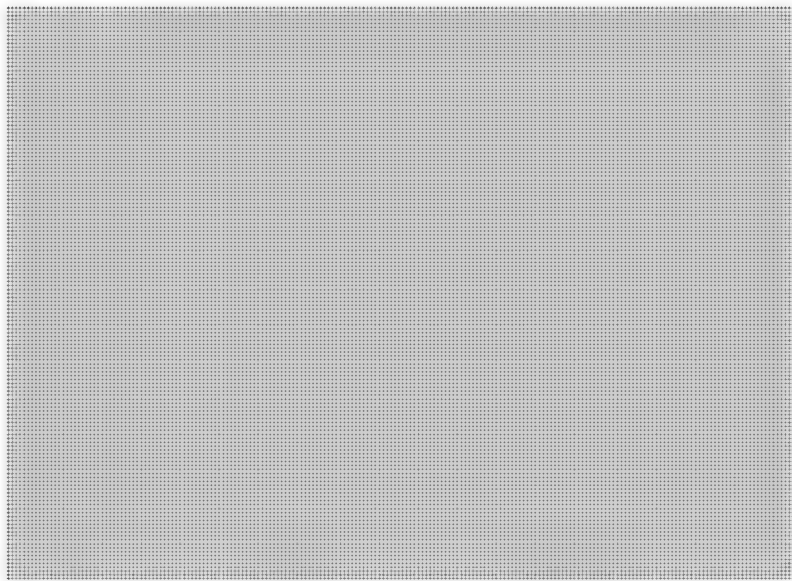
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FFAWU

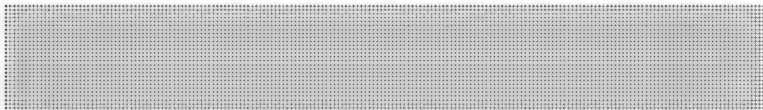
[REDACTED]

Port aux Basques Meeting - Mountain Marine Zonal Board (MMZB)

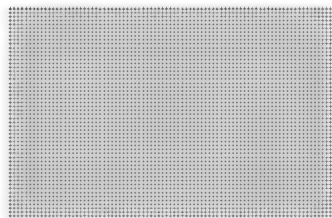
s.19(1)



Marystown Meeting



Burgeo Town Council



St. Bride's Fishers

s.19(1)

Natural History Society

Abbott, Melissa H

From: Simms, Jason
Sent: Thursday, July 16, 2009 12:01 PM
To: Abbott, Melissa H
Subject: RE: Southern NL SEA - Draft Consultation Report
Attachments: Southern NL SEA_Draft Final Consultation Report_090710.doc

See attached tracked changes.

s.16(2)

Jason Simms

-

Manager

National Centre of Expertise

Cold-Water Corals and Sponge Reefs

Oceans, Habitat, and Species at Risk Branch Fisheries and Oceans Canada Newfoundland and Labrador Region

-

Northwest Atlantic Fisheries Centre

P.O. Box 5667 St. John's NL A1C 5X1

PH: 709-772-8014

CELL: [REDACTED]

FX: 709-772-3578

jason.simms@dfo-mpo.gc.ca

NOTE: Fisheries and Oceans Canada (DFO) e-mail addresses are changing. Please adjust your address books and contact lists to:

jason.simms@dfo-mpo.gc.ca

-----Original Message-----

From: Abbott, Melissa H

Sent: Monday, July 13, 2009 11:37 AM

To: Simms, Jason

Subject: FW: Southern NL SEA - Draft Consultation Report

Hi Jason

Could you have a look at the sections I highlighted in this report, they refer to Coral Zone Protection.

I am not sure if you would have any comments, but if you do, could you let me know by the end of this week (Friday July 17)

Thanks

melissa

Melissa Abbott

Oceans Biologist

Oceans, Habitat, & Species at Risk

Fisheries and Oceans Canada

PO Box 5667, St. John's, NL

A1C 5X1

(T) 709-772-6270

(F) 709-772-3578

s.19(1)

(Email) melissa.abbott@dfo-mpo.gc.ca

-----Original Message-----

From: Young, Elizabeth [mailto:EYoung@cnlopbnl.ca]

Sent: Monday, July 13, 2009 9:25 AM

To: [REDACTED] chriscarter@gov.nl.ca; [REDACTED] glenn.troke@ec.gc.ca; Meade, James; jeanette.goulet@ec.gc.ca; [REDACTED]

[REDACTED] Abbott, Melissa H; [REDACTED] Francine Mercier

Cc: [REDACTED]

Subject: Southern NL SEA - Draft Consultation Report

Good Day All,

I have received a draft Consultation Report from LGL. Information from this report will be incorporated into Draft Two with the report itself contained in an Appendix of the report. I ask that you review the attached and provide comments to me no later than July 31 in order for LGL to address them before Draft Two has to be finalized.

Please contact me if you have any questions.

Regards

Elizabeth

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Southern Newfoundland SEA: Report On Industry, Agency and Community Consultations

Introduction

Consultations for this Strategic Environmental Assessment (SEA) report were undertaken with relevant agencies and SEA area stakeholder groups during May and June 2009. Meetings were held in Port aux Basques, Burgeo, Marystown, St. Bride's and St. John's. These consultations were organized and coordinated by Canning & Pitt Associates, Inc., with additional assistance from the Mountain Marine Zonal Board, the Schooner Regional Development Board, the Burgeo Town Council and fisher representatives in Burgeo and Marystown.

Information and background data pertaining to the SEA were sent via email to various agency representatives and potential participants prior to face-to-face meetings and/or follow-up telephone interviews.

A representative of the C-NLOPB and a member of LGL's Study Team attended area-level meetings scheduled in various SEA area communities. At each meeting, following general introductions and a short discussion of the purpose of the consultations, the Board's representative, Elizabeth Young, presented an overview outlining the C-NLOPB's role and mandate, the purpose and scope of the SEA process and a review of the various environmental components to be addressed in the SEA Report. Other information provided by the consultants was then presented and reviewed.

Following these presentations, there was a general round-table discussion that included comments and questions from participants concerning various aspects of the SEA process, potential offshore exploration and development activities, and issues and concerns about the fisheries and marine environmental components. All of the comments, questions and issues raised by participants were noted and recorded.

Appendix 1 contains a complete list of the agencies, individuals and groups who participated in the consultation meetings or else received SEA background documents and other related information for their review and comment.

Issues and Concerns

The following sections provide a summary of the topics and issues discussed at each consultation meeting, or with other stakeholders via telephone and/or email communication.

Fisheries and Oceans. DFO managers provided a detailed description of the department's ongoing LOMA (Large Ocean Management Area) process, and the various ongoing initiatives and research efforts associated with identifying biologically sensitive or important areas (e.g. an EBSA) within a specific LOMA located within the SEA study area.

The consultants asked how the LOMA process might relate to the SEA process; for example, will some of the sensitive areas with a particular LOMA eventually be "off limits" to oil and gas exploration? DFO's Ocean Governance Co-ordinator noted that indeed that may be the outcome in some cases. It was further suggested that, in a call for bids process, the C-NLOPB might decide not to nominate an EBSA area because of its biological or ecological 'sensitivity'. It was also noted that, if a Marine Protected Area (MPA) was designated, there might well be relevant conditions attached to that MPA vis-a-vis any potential restrictions on oil and gas exploration activities with that area.

In future, then, the presence of an EBSA might be expected to give industry proponents, or the C-NLOPB, a "heads up" about some offshore areas. In other words, although DFO managers cannot yet say with certainty that a particular offshore area would be "off limits" to oil and gas exploration activities, at present the EBSA process at least serves to raise a "red flag" to the industry regarding any such areas.

Department of Fisheries and Aquaculture (DFA)

DFA was contacted for an update on aquacultural operations in the western portion of the SEA area, i.e. the shoreline area between Grey River and Port aux Basques. Previous consultations (2006) had identified the location of a licenced cod grow-out operation at Venil's Island close to Burgeo. The department's Manager of Aquaculture Licencing and Inspections reports that this site is no longer operative and the licence has lapsed. However he notes that the department has received applications for four salmonids sites in Bay de Vieux, just to the west of Grey River (T. Budgell, pers comm., July 2009).

Port aux Basques - Rose Blanche - Burgeo Fisher Meetings. In 2006, during consultations for the Sydney Basin SEA, fish harvesters operating in various fishing communities between Port aux Basques and Burgeo provided extensive comments about their region's fisheries resources as well as their concerns about future offshore oil exploration activities and potential interactions with their established fisheries.

Meetings for these same fishers were scheduled and advertised as part of the area-level consultations for this SEA report. But, for various reasons, fishers did not attend the meetings in Port aux Basques or Burgeo. However the FFAW's Stewardship Co-ordinator (for western and northern Newfoundland and Labrador) attended both meetings and provided some general comments on the area's fisheries milieu.

Port aux Basques Meeting. The Port aux Basques area meeting was organized with the assistance of the Marine Mountain Zone Corporation (MMZC), and was well attended by various Corporation Board members representing a range of local groups and agencies.

A number of general questions and comments were raised and discussed following the Study Team's presentation.

With respect to special or sensitive areas or resources within the region, it was noted that a large number of shipwreck sites have been identified, including a heritage wreck just off Isle aux Mort.

It was noted that a Marine Protected Area (MPA) is being considered for the region (in the Burgeo area), and someone asked if that area would be closed to exploration activities while it was being considered for a MPA. Another person asked if oil exploration activities would be detrimental to some of the marine resources within a MPA.

Concern was also raised that if an EBSA is declared this might act as an impediment to the development of the region's oil and gas resources. For example, it was suggested that an oil company might decide not to explore for oil in an EBSA because that area might be closed to oil-related operations in the future. It was also noted that all of these "environmental rules" were not in place when Hibernia was being developed, and that these new regulations, etc., would make it more difficult to get an offshore industry started in this region. There were a few questions about exploration licences, e.g. how many years does a company have before it has to drill a well, and how long might it take to get some oil development activity underway in the region.

The Corporation's Executive Director, who is also a member of the SEA Working Group, noted that she would be reviewing the draft SEA report and distributing copies to various local agencies and stakeholders for their comments.

Burgeo Town Council. Discussions with Council representatives focused on the area's plans for establishing a National Marine Conservation Area (NMCA), and on several concerns fishers have raised regarding the potential negative effects on fisheries resources from previous and future oil and gas exploration activities.

The Mayor explained the situation regarding the proposed NMCA initiative noting many of the same points he raised in previous consultations with the Board (Sydney Basin SEA, 2006), and reported that Council and other local groups have made very little progress on this matter in the past three years. He reiterated that the MCA initiative was launched in 2003 under the auspices of the Burgeo Economic Diversification Board (BEDB), and that the project has the support and endorsement of many local groups and area fishers. If approved, the NMCA would cover a relatively large coastal and inshore zone, approximately from Grand Bruit to Francois out to about 15 km offshore. However, it seems that the project is being held up because the relevant federal and provincial agencies cannot agree how to proceed.

If a MCA is eventually declared, it remains unclear whether oil and gas exploration activities would be permitted within that area. Another Councilor asked if the designation of a MCA would affect Husky's exploration of its lease area in the Burgeo Bank area.

The Mayor also noted that local fishers remain concerned about the negative effects of oil and gas exploration activities. They have reported that a seismic vessel went through some crab grounds 80 km offshore three years ago and crab have since “disappeared” from that area. A Councilor, who is also a fisher representative, said that fishers report finding a significant increase in the number of lobsters close to shore and claim that offshore seismic operations had “driven these lobsters inshore”. He went on to note that the western portion of the St. Pierre Bank is a relatively new crab fishing area, and fishers might be concerned if exploration activities were to take place in that zone. Another person asked if there have been any studies undertaken to assess the potential effects of seismic operations on crab. LGL’s biologist responded to this question describing the research his firm had done on the effects of seismic on crab several years ago. Council members suggested that exploration companies should consult with fishers regarding the best time to conduct seismic surveys in this region.

In a final comment, one Council member said that, if any offshore exploration activities do take place in this area, the community would like to see Burgeo used as an onshore supply / service base for those activities.

Marystown Meeting. The Marystown meeting was organized with the assistance of the Schooner Regional Development Corporation. Most of the discussion at this meeting focused on the offshore harvesting activities within the SEA area by vessels operated by Ocean Choice International (OCI). The manager responsible for OCI’s fleet spoke about his company’s fisheries and how they relate to DFO’s LOMA initiative, in particular the potential implications of the departmental identification of EBSAs. OCI’s fleet manager, along with other industry agency representatives - e.g. GEAC - is a member of the DFO working group involved in the EBSA process.

Based on discussions within the DFO working group, the fishing industry’s view is that DFO’s long-term intention is to designate one or more Marine Protected Areas (MPA) and that the identification of EBSAs is an important part of the process of selecting an offshore area as a candidate for a MPA. As such, OCI and GEAC have indicated to the department which area the fishing industry would prefer to see designated as a MPA, if DFO proceeds to establish such an area (or areas).

OCI (and other offshore harvesting firms) would like certain specific offshore areas to be “off limits” for a MPA. These include the St. Pierre Bank area, which is an important cod fishing zone for OCI’s fleet, and likewise the Burgeo Bank area which is one of the company’s key redfish grounds. OCI has told DFO that the declaration of a MPA on the Southeast Shelf (edge and slope) would result in a closure of the company’s Marystown processing facility because that is where the company harvests its yellowtail.

As such, OCI has told DFO that, if a MPA is to be declared, it should be within the NAFO-designated Coral Protection Zone (CPZ), since OCI (or it predecessor company FPI) have never been overly dependent on that particular area, though it was noted that OCI continues to fish redfish in the CPZ using mid-water trawls which do not come in contact with the coral resources-species in this zone.

By extension, in light of the above discussion, it is evident that OCI would also prefer that future oil and gas exploration activities avoid having any negative effects on the company's key, important fishing grounds in the offshore areas identified above, i.e. Burgeo Bank, St. Pierre Bank and the Southeast Shelf.

The meeting ended with a brief question from the Corporation's Executive Director concerning ConocoPhillips' plans to drill a well in the Laurentian Sub-Basin. The Corporation wanted to know the date the company needed to do this work in order to meet its lease obligations. It was also noted that area fishers are relatively pleased with the results of the ESRF-funded research undertaken to assess the potential negative effects of seismic operations on monkfish eggs.

St. Bride's Meeting. Together with several other enterprises from this community, fishers attending the meeting take a portion of their annual catch (crab, cod and other groundfish) within the SEA area, e.g. in 3PSF and 3PSn. They noted their concern that eventually, they might be excluded from fishing in the EBSAs that have been identified by DFO. The CPZ ~~area~~ ^{area} within 3O is a much better turbot fishing area compared to other 3PS fishing zones where this species is now taken.

They would prefer not to see any exploration activities in the St. Pierre Bank area, and suggest that the Halibut Channel should also be "off limits" to oil activities. They take a significant portion of their crab in this area. Grounds along the edge of the slope are also important areas for monkfish, cod and halibut, and the Easter and Wester Gullies – especially areas where water depths are between 450 – 750 fathoms – are important grounds for these and other 3PS fishers as well.

Conne River Band Council. During preparation of the Sydney Basin SEA report, in 2006, the SEA study team obtained detailed information on the type and location of fish harvesting activities that were under the jurisdiction of the Conne River Band Council ("the Council"). The SEA report presented a detailed description of those fisheries.

In the process of preparing the present SEA report, the consultants contacted the Council's fisheries resource manager for an update on the harvesting activities of Band members. The description prepared for the 2006 SEA report was sent to the Operations Manager for her comment and review. She subsequently reported that there have been no changes in the Band's communal/commercial fisheries operations since 2006 (J. Drake, pers comm., June 2009).

Environment Canada. Agency managers received relevant background information on the SEA process and study research. In response, the agency's EC's Environmental Assessment Coordinator indicated that he and his managers will be reviewing the draft SEA report and providing any written comments to the Board (G. Troke, pers comm., June 2009).

Fish Food and Allied Workers Union (FFAWU) Meeting. Following a presentation by LGL's representative, there was a short discussion of the DFO LOMA process, and the designation of various EBSAs offshore. The FFAW's representative in this process has suggested to DFO that, if the department wants to create a Marine Protected Area, they should establish one within the existing NAFO Cereal Protection Zone.

Commenting on the various commercial fish species that LGL had identified as being economically important, it was noted that the economic value and importance of a particular species can vary greatly over time, depending on market conditions, product prices and resource abundance. As such, it was suggested that a 10-year perspective might not be long enough to identify which species are of economic importance to harvesters vis-a-vis future oil and gas exploration activities.

FFAW managers noted that fishers are becoming more and more concerned about the additional costs incurred in having to steam around the existing offshore production facilities located in the Jean d'Arc Basin area. Though it was acknowledged that this matter is not within the geographic scope of the present SEA study, it is nevertheless an issue which will become of greater concern to the fishing industry as exploration activities expand and as more oil fields come into production.

Concern was expressed about the potential negative effects on fisheries resources of seismic activities, and mention was made of fisher reports that seismic survey operations in the Laurentian Channel several years ago drove all of the crab away from established fishing grounds. FFAW managers reiterated their view regarding the need for long-term monitoring to assess any negative effects on fish and fisheries operations. It was also suggested that, during their regular exploration activities, oil companies could help fill data gaps in our knowledge of fisheries resources. For example, ROV operations associated with various exploration activities could be used to gather data to identify spawning areas.

Natural History Society (NHS). Members of the NHS received relevant background information on the SEA process and the SEA environmental assessment report, but have not yet responded with any comments or concerns.

Association of Seafood Producer (ASP)

The consultants met with the Association's Executive Director to review and discuss the SEA process and the fisheries data to be included in the SEA report. The ASP had no major concerns or issues with respect to the proposed SEA Area, and the Executive Director noted that his group always appreciates the opportunity to review and comment on offshore oil and gas activities as they relate to the province's fisheries industry.

Ocean Choice International (OCI). OCI's Manager of Fleet Administration and Scheduling attended the Marystown meeting organized by the Schooner Regional Development Corporation. His comments are included in the report of that meeting, as discussed above.

Other Corporate Harvesting Firms and Agencies. Background information on the SEA area and on the SEA environmental assessment process were sent to relevant managers of Clearwater Seafoods Limited Partnership, Icewater Fisheries Ltd., and also to the Groundfish Enterprise Allocation Council. However, to date, none of these groups have responded with any comments or concerns.

Appendix 1. Agencies and Persons Consulted

DFO

Jim Meade, Senior Regional Habitat Biologist

Geoff Coughlin, Oceans Governance Co-ordinator (Oceans Division)

Leon Slaney, Area Chief of Resource Management, Grand Bank Office

Department of Fisheries and Aquaculture (DFA)

Todd Budgell, Manager, Aquaculture Licencing and Inspections (Grand Falls)

Environment Canada

Glenn Troke, Environmental Assessment Coordinator

s.19(1)

Clearwater Seafoods Limited Partnership



Icewater Fisheries Ltd.



Ocean Choice International (OCI)

[REDACTED]

Association of Seafood Producers

s.19(1)

[REDACTED]

Groundfish Enterprise Allocation Council (Ottawa)

[REDACTED]

Conne River Band Council

[REDACTED]

FFAWU

[REDACTED]

Port aux Basques Meeting - Mountain Marine Zonal Board (MMZB)



s.19(1)

Natural History Society



Abbott, Melissa H

From: Griffiths, Helen
Sent: Tuesday, July 21, 2009 12:01 PM
To: Abbott, Melissa H
Subject: RE:



Melissa
SNSEA.doc

Just some suggestions. [REDACTED]

s.19(1)

s.21(1)(b)

From: Abbott, Melissa H
Sent: Tuesday, July 21, 2009 11:41 AM
To: Griffiths, Helen
Subject:

<< File: SNSEA.doc >>

Hi Helen

Do you think you can give a quick read to the attached. This is to be included with the notes that I have concerning the Southern Newfoundland Strategic Environmental Assessment Comments that I asked you to read earlier. [REDACTED]

Melissa Abbott
Oceans Biologist
Oceans, Habitat, & Species at Risk
Fisheries and Oceans Canada
PO Box 5667, St. John's, NL
A1C 5X1

(T) 709-772-6270
(F) 709-772-3578

(Email) melissa.abbott@dfo-mpo.gc.ca

There appears to be some confusion and apprehension regarding some of the tools that Fisheries and Oceans (DFO) utilized for the protection of fish, fish habitat, and ecological areas. The identification of Ecologically and Biologically Significant Areas (EBSAs) is not a general strategy for protecting all habitats and marine communities that have some ecological significance. It is a tool for highlighting an area that has particularly high Ecological or Biological Significance and to facilitate provision of a greater-than-usual degree of risk aversion in management of activities in areas of especially high ecological and biological significance.

Just because an area is identified as an EBSA, does not give it any special legal status. Rather, the identification provides guidance on the standard of management that is considered to be appropriate.

DFO NL Region has identified 11 EBSAs within the Placentia Bay Grand Banks Large Ocean Management Area (PBGB LOMA). Such areas may require some level of protection, such as a Fisheries Act closure, a National Marine Conservation Area, a Marine Wildlife Area or a Marine Protected Area. The most appropriate form of protection will be determined in consultation with DFO Science and FAM, other federal or provincial departments with a mandate to establish marine conservation areas, as well as affected stakeholders as potential Areas of Interest (AOIs) for Marine Protected Area (MPA) designation. As a result of informal discussion with key stakeholder groups, and the application of technical and feasibility criteria, five of the 11 EBSAs were put forward for formal consultation with stakeholders. Of the five EBSAs put forward, for this formal consultation, three: the Southwest Shelf Edge and Slope; St. Pierre Bank; and the Laurentian Channel are located within or adjacent to the SEA study area. Following consultations, DFO - NL Region will put forward/recommend one of the five EBSAs as the regional AOI for MPA designation by 2012.

There are also questions regarding activities that would be permitted within MPAs. The activities that take place within an *Oceans Act* MPA will depend on the goals conservation priorities set for each particular site. DFO will work with local resource users to identify activities that will be permitted within future MPAs. The level and types of activities permitted within a particular MPA may range from strict protection to multiple uses. The objective of an MPA is to conserve and protect the ecological integrity of marine ecosystems, species and their habitats. Management Plans for a specific MPA will be developed with involvement of local resource users and affected parties. Some MPAs may be strict no-take zones while others may be sustainably managed.

Abbott, Melissa H

From: Kuehnemund, Sigrid
Sent: Thursday, July 23, 2009 4:48 PM
To: Abbott, Melissa H
Subject: RE: Southern NL SEA - Draft Consultation Report
Attachments: SNSEA.doc

Please see comments in track changes for your consideration.....

Sigrid

-----Original Message-----

s.19(1)

From: Abbott, Melissa H
Sent: Tuesday, July 21, 2009 1:33 PM
To: Kuehnemund, Sigrid
Subject: FW: Southern NL SEA - Draft Consultation Report

Hi Sigrid

The attachment from the original email (in the attachment line), summarizes the comments received by the Consultant when holding consultations for the SN SEA Report. There appears to be some confusion surrounding EBSAs and the possible designation of a MPA. I plan to send back the original with track changes and I also have general comments that I want to include. I have incorporated comments from Helen, Geoff, Jason and myself. I was wondering if you wanted to have a look, especially at the general comments, before I send in on to CNLOPB.

(There seems to be a lot of "concern" over the whole EBSA, MPA process and just wanted to run it by you..)

Comments are due back to CNLOPB on July 31, [REDACTED] I wanted to send by Friday (July 24)

Thanks
Melissa

Melissa Abbott
Oceans Biologist
Oceans, Habitat, & Species at Risk
Fisheries and Oceans Canada
PO Box 5667, St. John's, NL
A1C 5X1

(T) 709-772-6270
(F) 709-772-3578

(Email) melissa.abbott@dfo-mpo.gc.ca

-----Original Message-----

From: Young, Elizabeth [<mailto:EYoung@cnlopb.nl.ca>]

Sent: Monday, July 13, 2009 9:25 AM

To: [REDACTED] chriscarter@gov.nl.ca; [REDACTED] glenn.troke@ec.gc.ca; Meade, James; jeanette.goulet@ec.gc.ca; [REDACTED]
[REDACTED] Abbott, Melissa H; [REDACTED] Francine Mercier

Cc: [REDACTED]

Subject: Southern NL SEA - Draft Consultation Report

Good Day All,

s.19(1)

I have received a draft Consultation Report from LGL. Information from this report will be incorporated into Draft Two with the report itself contained in an Appendix of the report. I ask that you review the attached and provide comments to me no later than July 31 in order for LGL to address them before Draft Two has to be finalized.

Please contact me if you have any questions.

Regards
Elizabeth

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Just because an area is identified as an EBSA, does not give it any special legal status. In terms of restrictions or special protection measures. ~~Rather,~~ the identification simply provides guidance on the standard of management that is considered to be appropriate.

DFO NL Region has identified 11 EBSAs within the Placentia Bay Grand Banks Large Ocean Management Area (PBGB LOMA). Such areas; may require some level of protection, which may be achieved by implementing such as a Fisheries Act closure, a National Marine Conservation Area, a Marine Wildlife Area or a Marine Protected Area, or perhaps may be addressed through some other avenue such as a National Marine Conservation Area, or a Marine Wildlife Area.. The most appropriate form of protection will be determined in consultation with DFO Science and FAM, other federal or provincial departments with a mandate to establish marine conservation areas, as well as affected stakeholders as potential Areas of Interest (AOIs) for Marine Protected Area (MPA) designation. As a result of informal discussion with key stakeholder groups, and the application of technical and feasibility criteria, five of the 11 EBSAs were put forward for formal consultation with stakeholders. Of the five EBSAs put forward, for this formal consultation, three: the Southwest Shelf Edge and Slope; St. Pierre Bank; and the Laurentian Channel are located within or adjacent to the SEA study area. Following consultations, DFO - NL Region will put forward/recommend one of the five EBSAs as the regional Area of Interest (AOI) for MPA designation by 2012.

There are also questions regarding activities that would be permitted within MPAs. The activities that take place within an *Oceans Act* MPA will depend on the goals conservation priorities set for each particular site. DFO will work with local resource users to identify activities that will be permitted within future MPAs. The level and types of activities permitted within a particular MPA may range from strict protection to multiple uses. The objective of an MPA is to conserve and protect the ecological integrity of marine ecosystems, species and their habitats. Management Plans for a specific MPA will be developed with involvement of local resource users and affected parties. Some MPAs may be strict no-take zones while others may be sustainable managed.

Carroll, Marlene

From: Morgan, Joanne
Sent: 2009–August-24 2:30 PM
To: Templeman, Nadine
Cc: Power, Don
Subject: RE: SNL SEA - Posting and Instructions for Reviewers



**Southern NL
strategic enviro...**

Nadine. Attached are a few comments.

Joanne Morgan
Research Scientist
Aquatic Resources Division
Northwest Atlantic Fisheries Centre
Fisheries and Oceans Canada
709 772 2261
joanne.morgan@dfo-mpo.gc.ca

From: Templeman, Nadine
Sent: August 21, 2009 11:07 AM
To: Dwyer, Karen; Healey, Brian; Morgan, Joanne; Murphy, Eugene; Parsons, Dawn; Power, Don; Simpson, Mark R; Sjare, Becky; Stenson, Garry; Bourgeois, Chuck; Dawe, Earl; Stansbury, Don; Collins, Roanne; Pepin, Pierre; Morris, Corey; Wilkinson, Kent; Anderson, M. Robin; Payne, Jerry F; Ollerhead, Neil; Stirling, Charles; Mabrouk, Gehan; Wheeler, John; Worcester, Tana; Mowbray, Fran; Nakashima, Brian; Han, Guoqi
Cc: Parsons, Jay; McCallum, Barry; Clarke, Keith; Sutton-Pande, Vanessa
Subject: SNL SEA - Posting and Instructions for Reviewers

Good day everyone,

The SNL SEA arrived yesterday and has now been posted to the shared folder (\\nflwhhfs01\Science Info\CSA Review\Review of SEA for Southern NL). You should all now be able to access this document through permissions for this folder and/or the online link (http://www.cnlopb.nl.ca/env_strategic.shtml#Current) at CNLOPB.

In keeping with its commitment to regularly update SEAs, the CNLOPB is seeking to update the SEA for the Laurentian Subbasin (2003), and the SEA for the Sydney Basin (2007) (where necessary) to be included with the new assessment of an area east of the Laurentian Subbasin. Further information on the Background, Area, Objectives, and intended Scope of the SEA can be found within the Southern Newfoundland SEA Scoping Document (attached and online).

Also for your information and assistance, comments from the previous reviews have also been posted to the shared folder and are attached to the initial email you received from Vanessa (below) several weeks ago.

INSTRUCTIONS FOR REVIEW:

- Please read the Southern Newfoundland SEA Scoping Document for guidance on expectations for the SEA.
- Science review of the SEA will focus on the identification of data gaps, inaccuracies, and inconsistencies.
- Please provide comments back to me by Section # (i.e., Section 3.2.2 – “comment”)

At this point I will be drafting the SSRP response from the collated comments (couple of days or so)

- Reviewers to review draft SSRP – participate in conference (with Maritimes) call on comments if required

I will finalize the SSRP document based on comments from the draft, obtain Regional approval, and send our response to Habitat for the deadline.

TIMELINES:

The original timeline for completing the review is below:

August 17 - September 11	19 working days	Review of SEA and submission of written comments
September 11-18	5 working days	Chair to draft SSRP document and distribute to reviewers
September 21-28	5 working days	Conference call to discuss draft Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers
September 29	1 day	Regional approval of SSRP document and feedback to Habitat

However, we have since learned that CNLOPB has moved the deadline for delivery to **September 16. We continue to work on this - and will send an updated timeline if required (but hopefully not!!)**

Please contact me if you have any questions or concerns on this, or if you are unable to access the shared folder.

Nadine Templeman

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

From: Sutton-Pande, Vanessa
Sent: Friday, August 07, 2009 2:54 PM
To: Dwyer, Karen; Healey, Brian; Morgan, Joanne; Murphy, Eugene; Parsons, Dawn; Power, Don; Simpson, Mark R; Sjare, Becky; Stenson, Garry; Bourgeois, Chuck; Dawe, Earl; Stansbury, Don; Collins, Roanne; Colbourne, Eugene; Pepin, Pierre; Morris, Corey; Wilkinson, Kent; Anderson, M. Robin; Payne, Jerry F; Ollerhead, Neil
Cc: Mabrouk, Gehan; Parsons, Jay; Tillman, Joe; Mercer, Stephen G; Worcester, Tana; Grant, Carole; Meade, James; Maillet, Gary; Helbig, James; Senciall, Dave; Wheeler, John
Subject: SEA for Southern NL

Hello Everyone,

You are receiving this e-mail because you have been identified for the Science review of the Strategic Environmental Assessment (SEA) for Southern NL. For those sections that a specific reviewer has not been identified I would ask that Section Heads circulate as appropriate.

In response to the upcoming request for Science advice for the SEA for Southern NL, Science NL Region and Maritimes Region will be providing feedback to Habitat through a Science Special Reponse Process (SSRP). One published report will be produced from this process. A Chair will be selected for this process. We are looking at 1 of 2 options:

1. Circulation of SEA, a request for written input, chair to draft document and subsequent call to review the document.
2. Circulation of SEA, a request for written input, subsequent call to discuss, chair to draft document and second call to finalize document.

This is not a Regional Advisory Process (RAP). However, it is different than the route we have been providing Science advice for these requests (most recently) because a CSAS report will be produced and posted to the CSAS website under the SSRP series. The production of this document will include a collation of all comments and review (via conference call with Maritimes Region) of the Science comments provided. This process is intended to take place in the

same timeframe as previous reviews. Therefore, it is important that responses are sent to the Chair by the timelines that we have been placed under.

We currently expect to receive the SEA from Habitat **August 17th**. This will likely be circulated via CD's or shared drive. The following is the tentative schedule for completion of this process for option 1:

1. August 17th - September 11th: Review of SEA and submission of written comments
2. September 11-18: Chair to draft SSRP document and distribute to reviewers
3. September 21 - 28th - conference call to discuss draft and Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers
4. September 29th - Regional approval of SSRP document and feedback to Habitat

The following is the tentative schedule for completion of this process for option 2:

1. August 17th - September 11th: Review of SEA and submission of written comments
 2. September 14 or 15th: Conference call to review comments
 3. September 16- 28th - Chair to draft SSRP document and distribute to reviewers, followed by 2nd conference call to finalize SSRP document
 4. September 28th - Regional approval of SSRP document and feedback to Habitat
- These are tentative dates based on current time constraints and expected time of receiving the SEA for review. Once a Chair is selected he/she will have input into this schedule.

Attached are 4 background documents:

- A. Map of the area
 - B. Original Scoping document
 - C. 2003 DFO Science (NL Region) review and comments of the second draft of the Laurentian Subbasin Strategic Environmental Assessment (SEA)
 - D. 2003 DFO Science (Maritimes Region) review of the draft of the Laurentian Subbasin Strategic Environmental Assessment (SEA)
 - C. 2007 DFO Science (NL and Maritimes Region) review of the Sydney Basin Offshore Area Strategic Environmental Assessment (SEA) - Draft 2 (+ appendix)
- The Laurentian Subbasin and Sydney Basin Offshore Area are included within this current SEA.

If you have any questions about this process please let me know. Tana Worcester is the CSAS contact for the Maritimes.

Thanks,
Vanessa

Vanessa Sutton-Pande
A/ Coordinator, Centre for Science Advice (CSA)
Fisheries and Oceans Canada
Newfoundland & Labrador Region
Northwest Atlantic Fisheries Centre
P.O. Box 5667
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<< File: SA1037 Study Area Figure.doc >> << File: SCBasins SEA_scope_dft_rev1_081219.doc >> << File: SEA draft 2 sigrid.doc >> << File: Laurentian SEA Comments.doc >> << File: DFO Response to Sydney Basin SEA-Draft 2appendix.doc >> << File: DFO Response to Sydney Basin SEA-Draft 2.doc >>

Southern NL strategic environment assessment

3.2.1.1 Finfish

yellowtail flounder: The 3LNO portion of this area is assessed using a production model and it should be the results of this model that are reported rather than the results of the survey.

Information on spawning has been updated in Ollerhead et al 2004 DFO Tech Report 2522 and this is what should be cited for spawning time and area.

3.2.5 Planning implications

‘Directed cod and redfish fisheries in the SEA Area are each closed for several months each year due to declining stocks’. There is a closer in 3Ps for spawning for cod but I don’t think this has anything to do with declining stocks. In 3NO the cod stock is closed to directed fishing so there is a permanent closer not one of ‘several months’.

3.7.1.10 American plaice

American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated here.

5.2

‘Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production’. This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Templeman, Nadine

From: Wheeler, John
Sent: August-27-09 7:55 AM
To: Templeman, Nadine
Cc: Nakashima, Brian; Mowbray, Fran
Subject: RE: SNL SEA - Pelagics Section(s) for review
Attachments: Review of SNL SEA capelin Aug 2009.doc; 3.2.2.7 Sandlance revisions.doc

Nadine,

As requested, Brian Nakashima, Fran Mowbray and I have reviewed those sections of the SNL SEA pertaining to pelagic species. I have reviewed the sections on Atlantic herring (page 72), Atlantic mackerel (page 81), and Atlantic saury (page 84). I have no specific comments other than the information provided in these sections is rather superficial. Brian has provided specific comments on the section dealing with capelin and Fran has provided suggested revisions to the section dealing with sand lance (see attached files).

John

John P. Wheeler

Section Head, Pelagic Fish
Science Branch
Northwest Atlantic Fisheries Centre
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A1C 5X1

Ph: (709)772-2005
Fax: (709) 772-4188
Email: WheelerJ@DFO-MPO.GC.CA

From: Templeman, Nadine
Sent: Thursday, August 20, 2009 9:17 PM
To: Wheeler, John
Subject: SNL SEA - Pelagics Section(s) for review

Hi John,

Having gone through the outline of the SNL SEA that the Branch is currently responsible for reviewing, I have highlighted the section(s) below for Pelagics review.

While some of the document is clearly defined as requiring review from specific expertise, it is requested that reviewers also consider/browse the components identified for 'ALL' and/or 'RESPECTIVE SECTIONS' where their input may be valuable. Also, it will be very important to review and provide input, where applicable, to the Sections:

4.0 Exploration/Production Activities and Associated Environmental Effects
5.0 Cumulative Effects
6.0 Summary and Conclusions

Reviewers may also consider fish habitat (3.1) where required.

COMPONENT/SECTION	DIV/SECTION	REVIEWER	NOTES
3.2.1 Commercially-harvested Species	ALL		RESPECTIVE SEC
3.2.1.2 Finfish	Groundfish Pelagics		
3.2.2.3 Capelin	Pelagics		
3.2.2.7 Sandlance	Pelagics		
3.2.2.9 Atlantic Saury	Pelagics		
3.2.2.10 Shortfin Squid	Pelagics		
3.2.2.11 Sharks	Pelagics		
3.3.3.2 Atlantic Mackerel	Pelagics		
3.3.3.3 Shortfin Squid	Pelagics		
3.3.3.4 Capelin	Pelagics		
3.2.2 Non- commercial Species	ALL		RESPECTIVE SEC
3.2.3 Macroinvertebrate and Fish Spawning	ALL		RESPECTIVE SEC
3.2.4 DFO Research Vessel (RV) Surveys	ALL		RESPECTIVE SEC
3.2.4.1 Catch Weight	ALL		RESPECTIVE SEC
3.2.4.2 Catch Distribution	ALL		RESPECTIVE SEC
3.2.5 Planning Implications	ALL		RESPECTIVE SEC
3.2.6 Data Gaps	ALL		RESPECTIVE SEC
3.3.1 Commercial Fisheries	ALL		RESPECTIVE SEC
3.3.1.1 Commercial Fisheries Overview	ALL		RESPECTIVE SEC
3.3.1.2 SEA Area Commercial Harvest, 2000-2007	ALL		RESPECTIVE SEC
3.3.1.3 Emerging Fisheries/Under-utilized Species	ALL		RESPECTIVE SEC
3.3.3 Recreational Fisheries	ALL		RESPECTIVE SEC
3.3.4 Aboriginal Fisheries	ALL		RESPECTIVE SEC
3.3.5 Planning Implications	ALL		RESPECTIVE SEC
3.3.6 Data Gaps	ALL		RESPECTIVE SEC
3.8 Potentially Sensitive Areas	ALL		RESPECTIVE SEC

It would be much appreciated if you could **forward this email ASAP to designated reviewers (including yourself if appropriate) in your Section and cc: myself** so I can ensure that my distribution for emails to follow with information, instructions, timelines etc. for this review is complete. (You may find the table included above useful for assigning reviewers, but is not required for my purposes).

As of today, the deadline on submitting a FINAL collated response in the form of a CSAS SSRP (Science Special Response Process) document has been shortened by two weeks, and now stands at **September 16** – however, we are currently working getting an extension back to the original date of September 29.

Feel free to contact me should you have any questions or concerns on the above request. Again, your assistance in coordinating this matter is greatly appreciated ~ Thanks!

Nadine Templeman

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Review of SNL SEA

s.19(1)

I have read 3.2.2.3 Capelin (p.82) and 3.3.3.4 Capelin (p.151). If the remainder of this draft report is researched and written as these 2 sections on capelin have been, then I have serious doubts about the veracity of the entire document.

3.2.2.3

While it is technically true that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. The St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. There is a third stock, the Southeast Shoal or 3NO capelin stock that spawns on the bottom on the Southeast Shoal. All 3 of these stocks spend a portion of their life cycle within the SNL SEA. Calling capelin a non-commercial fish species seems inappropriate.

Capelin are found along the coasts, especially during spawning season, and predominantly offshore while immature and maturing. Capelin do not normally 'roll' on sand, usually fine to coarse gravels are the preferred substrate. On beaches, usually spawn 5 - 8.5C but have been observe to spawn at 4 - 10C. On the bottom, spawning temperatures can be as low as 2C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Spawning now goes into August.

Eggs are yellow not red. Larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper than near the surface.

Capelin feed throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Variations in yearclass strength have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

3.3.3.4

Capelin are not harvested recreationally using seines and traps. These are commercial gear types whose use require a commercial licence for a specific fishing area.

3.2.2.7 Sandlance

Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sandlance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabed on sandy seabeds. It lives partially buried in the sand and occasionally rising into the water column to feed. Sandlance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence, and is typically found at depths of less than 100 m. The species of sand lance most common present in the SEA Area is the northern sand lance (*Ammodytes dubius*), although it co-occurs over much of its range with the American sand lance (*A. americanus*) (Scott and Scott 1988). All species of *Ammodytes* spawn demersally either inshore or on offshore banks (e.g., the Grand Bank off Newfoundland) at depths down to 100 m. Spawning appears to occur within sandy habitat that is occupied year-round, and spawning migrations have not been documented (Robards et al. 1999). There is little information available regarding the time of spawning in the SEA Area. Most sand lance species are reported to spawn in fall or winter, although some populations apparently spawn in spring or summer (Robards et al. 1999). Winters (1983) noted that the main spawning season of northern sand lance on the Grand Bank of Newfoundland occurs from November through January; however, the presence of spent fish in April and May suggests that minor peaks in spawning may also occur in late winter or early spring. This species is not commercially fished, but is an important part of the marine food-web as it is a food source for marine mammals and several species of fish including cod

Templeman, Nadine

From: Morris, Corey
Sent: August-28-09 10:08 AM
To: Templeman, Nadine
Subject: Corey's review of SEA 2009.doc
Attachments: Corey's review of SEA 2009.doc

Hi Nadine

Hope this helps. Let me know the next steps. I will be in the field most of September, but should be in e-mail contact.
Corey

Section 1.2 Scoping

The scoping document indicates that project-environment interactions for the coastal environment will be identified and discussed. Boundaries for the study were chosen based on historical exploration, the 4000 m contour, and administrative boundaries. In a broader perspective, inshore areas could be impacted if the project were to reach the production stage; for example, it is recognized that ship traffic could increase.

The area for the SEA should extend to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. By including Placentia Bay, early stage planning could mitigate future cumulative effects.

3.1.2.2 Estuarine Algae

More emphasis should be placed on the role of eelgrass and other near shore habitats and communities. Eelgrass is considered an Ecologically Significant Species (ESS). The identification of Ecologically Significant Species (ESS) is a tool for calling attention to a species or community property that has particularly high ecological significance in order to facilitate provision of a greater-than-usual degree of risk aversion in management of human activities that may affect such species or community properties (DFO 2009). (Complete Reference - DFO. 2009. Does eelgrass (*Zostera marina*) meet the criteria as an ecologically significant species? DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2009/018.)

3.1.4 Benthic invertebrates

The references are dated, but it is recognized that limited recent information may be available. Several of the reviews cited consider the southern and South eastern coast of Newfoundland, - i.e. Hardy 1985, LeDrew 1984. The SEA area specifically does not include Placentia Bay area. There is no mention of invasive species anywhere in the report, such as green crab, probably because the review area does not consider the Placentia Bay. The review should consider the coastal areas of southern Newfoundland, these areas are mentioned several times in the SEA but not considered critically. Maybe a separate SEA for Placentia Bay alone can be conducted such that the information can be integrated with all other projects that depend on Placentia Bay. Maybe transport Canada has already done something like that, but perhaps that report is not as “Strategic” to encompass ecosystem effects.

3.2 Fish, 3.2.3 Macroinvertebrate and Fish Spawning, and 3.7.1.3 Species at Risk – Atlantic cod

These sections do not specifically address the importance of known pre-spawning and spawning aggregation behaviour of Atlantic cod - spatially. In Halibut Channel for example, cod form dense spawning aggregations in late winter and spring – and other

areas are probably well known also. The locations are generally consistent from year to year. Atlantic cod are potentially vulnerable while aggregated, and an effort should be made to identify locations of fish aggregations during critical life history processes, such as spawning. To some extent, this is addressed in 6.2.3.

4.2 Production Phase

Paragraph 2 – “All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast.” Ship traffic from the east coast to Placentia Bay is a concern, in that the coastal area including Placentia Bay is not considered in the SEA. An ecological implication might be related to invasive species which is not considered in the report at all.

4.5.6 Effects of Presence of Structures

This section does not include shore-base structures and related concerns.

4.5.6.6 Data Gaps

Regarding the artificial-reef-effect and potential science –based discussions, it is necessary to conduct multi-year monitoring to demonstrate effects, the most important component of such monitoring is pre-data. That is data (probably 3 years of it) before any construction takes place, and then additional data collection after construction is completed. Furthermore, control sites should accompany monitoring in areas that will not be affected at all. This is a Before-After-Control-Impact Design. This study design is being conducted in relation to wharf and breakwater constructions in Newfoundland to assist EA and HADD implications. To take advantage of science-based input, there should be discussions about planned activities, and monitoring, long before (i.e. 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to SEA process rather than the EA process if the general impacts can be identified early on.

4.5.9.1 Fish Habitat, Fish, and Fisheries

The report says, “There is no interaction between presence of marine vessels and the Fish VEC.” This is largely because the report does not consider coastal areas. Currently, Placentia Bay has a variety of invasive species – Is it possible that the invasive species that are in Placentia Bay arrived there by boat? The VEC effects of invasive species can be upon fish and fish habitat, and fisheries. The document is limited in this respect.

6.2.1 Identified Potentially Sensitive Areas

Categories of sensitive areas identified in the SEA do not include DFO-Oceans Act-Marine Protected Areas or MPA Networks specifically. Marine Protected Areas should be considered in addition to LOMA’s or EBSAs. Canada has international commitments

to produce MPAs and MPA networks. This process will integrate various federal departmental mandates (ie DFO, EC, and Parks) and the MPA process should be considered independent of DFO's EBSA process.

6.4 Addressing Data Gaps

Bullet 3 relates to monitoring that is specific to EAs. Where possible, it should be recognized that mitigation measures can be improved by early monitoring, before the EA process. The SEA process may identify and enable early planning initiatives to improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the "artificial-reef" idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (basically 3O). Throughout the review it is not clear as to what is being updated and what is new.

Templeman, Nadine

From: Bourgeois, Chuck
Sent: August-31-09 2:38 PM
To: Templeman, Nadine
Subject: RE: CONFIRMATION - Deadline for SNL SEA Review

s.21(1)(b)

Hi Nadine

I have reviewed the appropriate sections and offer the following comments:

1. Have photocopied pages 83 and 84 and have comments in text. I will drop this over to you.
2. Brook trout (anadromous form) are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery
3. American eels - reference is made to eel eggs being part of the Ictyoplankton. Eels are a commercial species and deserve a species write up. COESWIC is presently reviewing status American eels.
4. COESWIC is presently reviewing Atlantic salmon as well.
5. I suspect some Atlantic salmon from the endangered Inner Bay of Fundy listed stocks migrate through the study area.
- 6 There is no reference to historical Atlantic salmon commercial catch data. The fishery only closed in 1992.
7. There is a harvest of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon and may be for domestic harvest.

Anyway these are my comments and there may be rationale why the above referenced points were excluded - but I believe that they are worth a passing reference.

Regards

C.E. Bourgeois
A/Section Head, Salmonids
P.O. Box 5667, St. John's, NL, A1C 5X1
Tel: 709-772-2128; Fax 709-772-3578
New E-Mail: Chuck.Bourgeois@DFO-MPO.GC.CA

Templeman, Nadine

From: Pepin, Pierre
Sent: August-31-09 11:10 AM
To: Templeman, Nadine
Cc: Senciall, Dave; Anderson, M. Robin
Subject: SNL SEA review
Attachments: SEA Evaluation (Pepin).doc

Dear Nadine,

Attached are my comments on the sections of the report relevant to biological oceanography and ichthyoplankton matters. This SEA, like many of its predecessors, demonstrates the same sort of gaps in knowledge and analysis. Although it is our responsibility as an Agency to review this material, it should be the equal responsibility of the CNLOPB to ensure that the same omissions are not presented to us so that our time is wasted.

Pierre

Dr. Pierre Pepin
Fisheries and Oceans Canada
PO Box 5667
80 White Hills Road
St. John's, NL, A1C 5X1 Canada

Please note that my e-mail address has changed to pierre.pepin@dfo-mpo.gc.ca

SEA Evaluation

Section 3.1.3 – Plankton

The section provides a brief description of the principles involved in the seasonal production cycle, along with a summary description of the major elements of the planktonic food web. The section correctly identifies the area of the SEA as being an area with potentially high concentrations of euphausiids and calanoid copepods, partly as a result of convergence between substantive water masses in the region. Most of the section consists of composite satellite imagery of sea surface chlorophyll concentrations obtained from the Fisheries and Oceans Canada website. The document cites conditions noted in the 2006 (NL) and 2007 (Scotian Shelf) regional State of the Ocean Overviews, presumably to document the plankton aspect of Fish Habitats for the area. Later, the document indicates that planning considerations (3.1.5) should consider this area as one of enhanced production, largely as a possible area of congregation of higher trophic levels as a result of the concentration of plankton.

Evaluation

There are numerous oversights in the section that must be taken into consideration in the planning of activities and in the development of mitigation and monitoring activities if the interests of Canadians are to be addressed thoroughly.

Although the SEA has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2008, J. Northw. Atl. Fish. Org., 39:49-69) demonstrated high concentrations of this copepod in slope waters long the southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter), the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift [1] on the Eastern Scotian Shelf; and [2] into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Because this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of to productivity. Uncertainty in the drift paths for secondary producers is of similar to the concerns raised in section 3.2.6 for that of ichthyoplankton and macroinvertebrate eggs/larvae in the area. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are highly uncertain based on this report.

The overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for adjacent area. This is inadequate because the report fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area, there has to be quantification of the underlying variability in abundance. There are several data streams from which one could draw, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system based on collections from ships-of-opportunity is varied and may not directly transect the SEA study area, there is considerable information that can serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only by knowing the underlying variability would it be possible to assess whether changes that occur during and after the exploration program are within the bounds of natural variability that has been observed prior to the program. As it stands, the applicant appears to be taking 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

There is also no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. There is therefore a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

Section 4.5.4 – Effects of produced waters

The conclusion of the section is premature in stating that the potential impacts of toxic impacts of produced waters on the plankton populations of the region because, as the proponent indicates in section 4.5.4.4, there is currently insufficient knowledge of the make a clear determination that large volumes of produced waters do not have lethal or sublethal impacts on productivity of lower trophic levels. Work off Qatar (Abdel-Moati & El-Din, 2006, *Fresenius Environmental Bulletin*, 15: 259-266) found a degree of concentration of total petroleum hydrocarbons in zooplankton and ichthyoplankton. Although less than found in larger organisms, the higher production-to-biomass ratio of smaller organisms may affect their overall susceptibility to sublethal effects of produced waters. Furthermore, because a large fraction of the zooplankton population may over-winter at depth ranges where drilling mud deposition may influence near-bottom organisms, the possible toxicity impacts of this component of the exploration program should also be considered.

The solution to this concern, as stated in section 4.5.4.4, is to ensure that monitoring activities, performed at the appropriate time and spatial scales, be implemented as part of the activities of the exploration and production programs along the south coast of

Newfoundland. This should include testing prior to the implementation of such programs, as well as timely up- and down-stream monitoring of the state of key plankton.



Fisheries and Oceans Canada
Pêches et Océans Canada

Science

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Canadian Science Advisory Secretariat
Science Response 2009/nnn

Newfoundland and Labrador

REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 16, 2009. Given that DFO is not the final advisory body for this request (through the Canadian Environmental Assessment Act (CEAA) process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects ~~which that~~ may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project-specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within

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Canada

the study area, including: many species of fish, fish habitat (including benthic habitat); commercial fisheries, marine mammals and sea turtles, species at risk and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and Response

General Remarks/Observations:

Given the intent of a SEA to form a basis for subsequent environmental assessment (EA) planning by providing much of the background environmental information that will be used for EA purposes and to focus on the needs for additional research where information gaps are identified, a SEA report must be held to the same standards of documentation and quality as the subsequent EAs. Often, the SEA document is referenced as the basic information for an area during an EA. Therefore, if the information in the original SEA is not correctly addressed and referenced, scientific review of subsequent documents has the potential to be cumbersome through the search for the pertinent information and/or the original statement that is being cited.

However, ~~many~~ Many of the biological and ecological components of the draft SNL SEA are severely lacking in this required scientific rigor and documentation. Also in this respect, references are often lacking, are out of date, or improperly cited. For example, some conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced, while other references are cited using "as cited in" other reviews. With respect to the presentation of figures and tables, many of these lack sufficient detail for interpretation.

It was also noted throughout the review that this draft SEA demonstrates some similar omissions gaps in the description of existing knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided for this Region does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA. *Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.*

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential

impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are Northwest Atlantic Fisheries Organization (NAFO) sub-divisions, not Divisions. Additionally, it should be recognized that names common to some industries are not going to be common to all (e.g. locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the Stone Fence, are not common-place to most. It is suggested that a map displaying all place names that are referenced within the document be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

Sea surface temperature (SST) at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not "clearly show" the Labrador Current, but at most "suggests" its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), Acoustic Doppler Current Profile (ADCP) results (Contact Dave Sencill, DFO) or calculated geostrophic currents from Conductivity, Temperature, Depth (CTD) data would be useful ~~to~~ in relaying the appropriate information.

When available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document. A discussion of storm surges should also be included in this section.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, ~~is there any~~ explanation for the negative correlation between the summer North Atlantic Oscillation (NAO) index and the storm occurrence on the CHC Response Zone would be useful?

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. This may not be particularly relevant to impacts within the study area, but it could be relevant to distribution of discharges that were to occur along the north-western boundary of the SEA area.

~~However, this may not be particularly relevant to the study area.~~

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a Canadian Hydrographic Service (CHS) survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – ~~see sea~~ surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006) to address and highlight this interannual variability of the offshore Branch of the Labrador Current within the SEA.

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, "Fig. 2.18" in the text should read "2.28".

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only with the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

~~What is the~~ The location of the Eastern and Western Valleys is not clear? These should be indicated by either map or latitudes and longitudes in this section.

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, ~~it is not clear from the SEA why so much effort~~ significant effort and detail was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that this knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information and its relationship to environmental impacts considerations could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

Coral reefs are also a fish habitat VEC and should be highlighted as such in the introduction of this section.

Zooplankton and phytoplankton are considered fish habitat throughout the SEA. It is unclear why – reasoning for this – that should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Estuarine Algae - Overall, the community structure and composition of pelagic ecosystems in south coast estuaries is not adequately documented and requires elaboration.

Laminarial communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan *Membranipora membranacea*. The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and response. This should be considered in the SNL SEA – possibly through the addition and incorporation of a section specifically addressing this (and other) Invasive Species.

Also of note, benthic diatoms are commonly associated with intertidal sands and muds, not deep water communities as presented in the SEA.

Plankton (3.1.3)

This section ~~does not adequately describe shows a very poor understanding of~~ planktonic communities and their ecology – where much of the related discussion is an oversimplification that omits relevant details of community composition, succession and dynamics.

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters along the southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf; and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate since the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

It was also noted that there is no assessment of the biodiversity of the plankton food web in this report. [The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

Commented [T6]: Conclusion

More generally, since Station 27 is not located in or near the SEA area, if plankton dynamics are to be inferred from this station for the project area then the report must include a demonstration that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

Finally, it should be clarified if the comment on diurnal migration refers to which groups of zooplankton?

Benthic invertebrates (3.1.4)

~~While the references for benthic invertebrates are dated in the SEA. While this is often common in addressing this topic in the NL Region, it should be recognized that limited recent information may be available for consideration through unpublished benthic data (of non-commercial species) obtained during DFO RV surveys. With respect to the references that are provided in this section, the document However, this section presents a reference list only – there is no related synthesis or discussion.~~

Commented [17]: Reword – recent information sources.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the omission of this area for consideration within the overall context of the SEA, there is no mention of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Regarding the adjacent Scotian Shelf area, it would be useful to include a map showing the location of the Stone Fence (along with the representation of other coral areas).

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in ~~some of these instances species descriptions~~ as well.

Eels should be addressed specifically in the SEA. Available data for eels was used in the COSEWIC Assessment and Status Report (2006) ~~SARA assessment~~ and shows trends over time.

With respect to cod and redfish descriptions, stock status updates should be provided in the appropriate sections.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO SAR which is cited states, "CPUE changed little during 2004-2006 before **decreasing** in 2007". However, the most recent DFO Science Advisory Report (SAR) (DFO 2009a2009-045) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008b) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '*...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...*', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 **week** pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area. Additional information on sea cucumber in the Atlantic Region, including Newfoundland waters, can be found in DFO (2009e) and Recent information pertaining to this species in the SEA area can be obtained from Stansbury and Hynick (2009).

Finfish (3.2.1.2)

Redfish- In the third paragraph, "...and (3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]..." Should read "...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]..." Also, "The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.", is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the NAFO Divisions 3LNO portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank." However, the majority of catch of yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

White Hake- Minor spelling error in first paragraph. "Cape Halteras" should read "Cape Hatteras". Also, the statement "White hake are a temperate species at the limit of their temperature range and as a result are spatially restricted to the south western Grand Banks" is confusing and inconsistent with the previous statement that they range from Cape Hatteras to Southern Labrador. Perhaps reference to the SEA area would be helpful here.

Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by the Committee on the Status of Endangered Wildlife Species in Canada (COSEWIC), and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined Designatable Unit (DU), the SEA might consider reporting on the research vessel RV trends in each region individually.

Pollock- A more recent summary of information on pollock from NAFO Divisions 4VWX5Z is available in DFO (2009c) and Stone et al. (2009). More recent information on pollock from the Maritimes Region is available in DFO (2009) and Stone et al. (2009).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is not in the SEA area, but no references to the Subarea 2 + Divisions 3KLMNO stock (assessed by NAFO) where Division 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, "*it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$.*" does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPs4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "*These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...*", however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see <http://www.dfo-mpo.gc.ca/zone/underwater/sous-marin/atlantic/witch-plie-eng.htm>)

Haddock- The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Haqfish - Additional information on haqfish, including information from Newfoundland waters, can be found in DFO (2009d).

Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom,

spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sand Lance- For clarity and conciseness, suggested rewording of the section on sand lance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand lance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers and 82 salmon populations occur within the two SFAs with fourteen scheduled rivers occurring within the SEA area." Also, "There has not been a recent individual assessment of the stocks...in the SEA area, however, stock status is estimated from a series of index rivers."

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interjectory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Sharks- Some (most) of the information contained within this section are required. With respect to spiny dogfish, the congregations in the warmest available water (>8°C) and the population are comprised of both juveniles and mature adults. In regards to Porbeagle shark, it should be noted that they are found in the Laurentian Channel in spring, summer and fall, and that the population size of the Northwest Atlantic population was estimated to range from 94,329 to 195,290 fish in 2005, which is approximately 10 to 24% of the population size in

the 1960s. Finally, for haddock, mating appears to be most frequent in the spring to early summer season, but mature females are not seen in Canadian waters. Also, births have been observed to occur over a wide seasonal range from spring to fall, presumably in the eastern Atlantic.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next ten years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans. This potential for error in basing conclusions on such a narrow timeframe is especially pertinent to the use of 2006/2007 RV collected in the area during those years due to incomplete survey information resulting from vessel problems there during the same timeframe. Given that this incomplete information is not used in DFO stock assessments, it would also be inappropriate for use in a SEA.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...*They include deepwater redfish, thorny skate...*", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...*Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...*", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In

addition, the 3NO cod stock is **permanently** closed to directed fishing, not for '*several months*' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American Eel - Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut - It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 3O within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e., 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).]

American Plaice- Landings values in Figure 3.45 differ from values in the text. ~~Could it be possible that the figure be is describing American plaice harvest in Div. 30 only while the text is describing something else?~~ These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used. ~~In addition, consideration of industry restructuring is also pertinent to the use of 2006 bycatch landings values for American Plaice~~

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook Trout- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Marine Mammals (3.5)

The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was cited, the caveats associated with these data (listed much later in

the descriptive section) must emphasize when statements such as “Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed cetacean species within the SEA Area (251 sightings of 3249 individuals)”. While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as DFO must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years; the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution “patterns” are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast (see Lawson and Gosselin 2009).

With respect to specific statements on cetaceans, there have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement “Bottlenose whales were observed exclusively in offshore areas...” is not true/incorrect. Also, until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area “...presumably represent components of the Scotian Shelf population.” Regarding Blue whales, the statement “Blue whales were frequently observed in the SEA Area” is also incorrect as blue whales have been sighted here, but rarely. Finally, it should be included in the SEA that Sei whales have been seen close to shore in the SEA study area – two sei whales were seen observed in Placentia Bay in July.

Overall, the SEA does address seals very well. This area is an important transit area for harp and hooded seals during the winter and spring. Therefore they are seasonally abundant and not always associated with ice. Harbour seals are common in the area.

However, hooded seals have been assessed as ‘Not at Risk’ by COSEWIC while harps have never been assessed. This information should be corrected in Table 3.20

Additionally, the comment that grey seals are breeding on St. Pierre and Miquelon is not accurate. There have been a number of surveys that indicate few, if any, pups are born in the area. The total population of grey seals in the NW Atlantic is approximately 300,000 (not unknown – Table 3.16). This is available in a 2008 CSAS Research Document. The number present in the area is estimated from Hammill (2005) which provides estimates of abundance (that have been updated). Still, this cannot be used to estimate the total number of seals likely to be found in the area.

Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American Plaice- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote "a" after NL, but the footnote is not included.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Div-Subdivision 3Ps in the SEA, there is no information on plaice in Division 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

Leatherback Turtle- The large-scale aerial survey conducted in the late summer of 2007 (Lawson and Gosselin, 2009) provided data which allowed a minimal estimate of leatherback turtle abundance. For the south coast of Newfoundland survey stratum only, it was estimated that there were at least 700 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the consistent long-term use of this area in the summer and early fall by feeding turtles, and the seasonal abundance of primary turtle prey (jellyfish), is suggestive that the Newfoundland south coast might be considered critical habitat. Consideration of critical habitat will occur this week (Sept. 25, 2009) during a conference call with the federal leatherback turtle working group to update the Leatherback Action Plan to include critical habitat designations.

The text on page 221 does not include the leatherback sightings made during the 2007 aerial survey, and more recent data from other sources, but the overall pattern of most leatherbacks being on the south coast of Newfoundland will remain the same.

Loggerhead Turtle- There is a COSEWIC RPA process currently underway for loggerhead sea turtle that, although not currently available, should be considered during future EAs in the SEA area.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing Large Ocean Management Area (LOMA) boundaries should be included in the SEA for both NL and Maritimes Regions. In addition, LOMAs are **thousands** of square kilometres in size, not *hundreds* as stated in the SEA.

Ecologically and Biologically Significant Areas (EBSAs) (3.8.2)

It is more appropriate for this section to be titled EBSAs, AOIs, and Marine Protected Areas (MPAs) and include greater detail and discussion on the processes and implications of EBSAs.

establishing MPAs and MPA Networks. Also, six new MPAs are to be established under the Health of the Oceans (HOTO) Initiative, not nine as stated in the SEA. Further information on the potential management implications of these initiatives can be obtained from the DFO Oceans Sector.

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

Canadian Parks and Wilderness Society (CPAWS) Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area. Also in this table, more recent information indicates that the Southeast Shoal is no longer considered nursery habitat for American Plaice as stated in the text (K. Dwyer, pers. comm.).

As mentioned previously, the south coast of Newfoundland – particularly in the St. Pierre Bank area – is under consideration as critical habitat for leatherback sea turtles as a feeding area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cuttings under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al 2005; Mathieu et al 2005), and another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond "average" disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anarobiosis (e.g. from hydrogen sulfide), or for instance altered sediment

texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g. primary productivity), fish quality and fish health. However, given the large amount of available literature on this topic this section could have included more detail in the assessment. However, also as noted in the SEA, some further attention should also be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g. gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al 2007).

In Table 4.4, it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

Production Phase (4.2)

The SEA states, "All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast." Therefore, ship traffic from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Potential Sources of Effects from Routine Activities (4.4)

The release of drilling wastes to the bottom should be addressed in this section, and references for the duration of measurable concentrations of drilling waste on the bottom need to be included.

For the purposes of the discussion on offshore drilling the many wells of White Rose are used as a worst case scenario. It would be more appropriate to use the predictions developed for the individual EAs for exploratory wells on or near the Grand Banks in this case.

Interactions and Potential Effects of Routine Activities (4.5)

The use and effects of antifouling agents (on and offshore) should be discussed within the SEA in this section.

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

This discussion on sound mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long-term effects of exposure to deleterious levels of sound from these blasts.

On page 270 – there is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect must be removed.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

The disposal of drill cuttings and mud has the potential to cause a Harmful Alteration Disruption or Destruction (HADD), and therefore should be discussed in the section on Fish, Fish Habitat and Fisheries.

Templeman, Nadine

From: Healey, Brian
Sent: September-09-09 4:31 PM
To: Templeman, Nadine
Cc: Power, Don
Subject: RE: SNL SEA - Posting and Instructions for Reviewers

Hi Nadine; some comments:

Section 3.2.1.2

This section is incomplete. Much of the text refers to the Ghal stock in the Gulf of St. Lawrence which is outside of the SEA study area. In addition to the fishery data describing catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, the SEA area encompasses portion of the NAFO management unit area for Ghal in sub-Area 2 and Divisions 3KLMNO. (Comment also relevant to the Ghal description in Table 3.2).

Section 3.2.4. The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the SEA study area. As this SEA document is intended to serve as an assessment for potential activities over the next ten years, a two year time window may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans.

Section 3.3.1 Commercial fisheries section appears not to include any statistics from NAFO member states fishing within the portion of Division 3O within the NAFO regulatory Area (i.e. Outside 200mi).

Brian

From: Templeman, Nadine
Sent: Friday, August 21, 2009 11:07 AM
To: Dwyer, Karen; Healey, Brian; Morgan, Joanne; Murphy, Eugene; Parsons, Dawn; Power, Don; Simpson, Mark R; Sjare, Becky; Stenson, Garry; Bourgeois, Chuck; Dawe, Earl; Stansbury, Don; Collins, Roanne; Pepin, Pierre; Morris, Corey; Gilkinson, Kent; Anderson, M. Robin; Payne, Jerry F; Ollerhead, Neil; Stirling, Charles; Mabrouk, Gehan; Wheeler, John; Worcester, Tana; Mowbray, Fran; Nakashima, Brian; Han, Guoqi
Cc: Parsons, Jay; McCallum, Barry; Clarke, Keith; Sutton-Pande, Vanessa
Subject: SNL SEA - Posting and Instructions for Reviewers

Good day everyone,

The SNL SEA arrived yesterday and has now been posted to the shared folder (<\\nflwhhfs01\Science Info\CSA Review> Review of SEA for Southern NL). You should all now be able to access this document through permissions for this folder and/or the online link (http://www.cnlopb.nl.ca/env_strategic.shtml#Current) at CNLOPB.

In keeping with its commitment to regularly update SEAs, the CNLOPB is seeking to update the SEA for the Laurentian Subbasin (2003), and the SEA for the Sydney Basin (2007) (where necessary) to be included with the new assessment of an area east of the Laurentian Subbasin. Further information on the Background, Area, Objectives, and intended Scope of the SEA can be found within the Southern Newfoundland SEA Scoping Document (attached and online).

Also for your information and assistance, comments from the previous reviews have also been posted to the shared folder and are attached to the initial email you received from Vanessa (below) several weeks ago.

INSTRUCTIONS FOR REVIEW:

- Please read the Southern Newfoundland SEA Scoping Document for guidance on expectations for the SEA.
- Science review of the SEA will focus on the identification of data gaps, inaccuracies, and inconsistencies.
- Please provide comments back to me by Section # (i.e., Section 3.2.2 – “comment”)

At this point I will be drafting the SSRP response from the collated comments (couple of days or so)

- Reviewers to review draft SSRP – participate in conference (with Maritimes) call on comments if required

I will finalize the SSRP document based on comments from the draft, obtain Regional approval, and send our response to Habitat for the deadline.

TIMELINES:

The original timeline for completing the review is below:

August 17 - September 11	19 working days	Review of SEA and submission of written comments
September 11-18	5 working days	Chair to draft SSRP document and distribute to reviewers
September 21-28	5 working days	Conference call to discuss draft Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers
September 29	1 day	Regional approval of SSRP document and feedback to Habitat

However, we have since learned that CNLOPB has moved the deadline for delivery to **September 16. We continue to work on this - and will send an updated timeline if required (but hopefully not!!)**

Please contact me if you have any questions or concerns on this, or if you are unable to access the shared folder.

Nadine Templeman

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

From: Sutton-Pande, Vanessa
Sent: Friday, August 07, 2009 2:54 PM
To: Dwyer, Karen; Healey, Brian; Morgan, Joanne; Murphy, Eugene; Parsons, Dawn; Power, Don; Simpson, Mark R; Sjare, Becky; Stenson, Garry; Bourgeois, Chuck; Dawe, Earl; Stansbury, Don; Collins, Roanne; Colbourne, Eugene; Pepin, Pierre; Morris, Corey; Wilkinson, Kent; Anderson, M. Robin; Payne, Jerry F; Ollerhead, Neil
Cc: Mabrouk, Gehan; Parsons, Jay; Tillman, Joe; Mercer, Stephen G; Worcester, Tana; Grant, Carole; Meade, James; Maillet, Gary; Helbig, James; Senciall, Dave; Wheeler, John
Subject: SEA for Southern NL

Hello Everyone,

You are receiving this e-mail because you have been identified for the Science review of the Strategic Environmental Assessment (SEA) for Southern NL. For those sections that a specific reviewer has not been identified I would ask that Section Heads circulate as appropriate.

In response to the upcoming request for Science advice for the SEA for Southern NL, Science NL Region and Maritimes Region will be providing feedback to Habitat through a Science Special Reponse Process (SSRP). One published report will be produced from this process. A Chair will be selected for this process. We are looking at 1 of 2 options:

1. Circulation of SEA, a request for written input, chair to draft document and subsequent call to review the document.
2. Circulation of SEA, a request for written input, subsequent call to discuss, chair to draft document and second call to finalize document.

This is not a Regional Advisory Process (RAP). However, it is different than the route we have been providing Science advice for these requests (most recently) because a CSAS report will be produced and posted to the CSAS website under the SSRP series. The production of this document will include a collation of all comments and review (via conference call with Maritimes Region) of the Science comments provided. This process is intended to take place in the same timeframe as previous reviews. Therefore, it is important that responses are sent to the Chair by the timelines that we have been placed under.

We currently expect to receive the SEA from Habitat **August 17th**. This will likely be circulated via CD's or shared drive. The following is the tentative schedule for completion of this process for option 1:

1. August 17th - September 11th: Review of SEA and submission of written comments
2. September 11-18: Chair to draft SSRP document and distribute to reviewers
3. September 21 - 28th - conference call to discuss draft and Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers
4. September 29th - Regional approval of SSRP document and feedback to Habitat

The following is the tentative schedule for completion of this process for option 2:

1. August 17th - September 11th: Review of SEA and submission of written comments
2. September 14 or 15th: Conference call to review comments
3. September 16- 28th - Chair to draft SSRP document and distribute to reviewers, followed by 2nd conference call to finalize SSRP document
4. September 28th - Regional approval of SSRP document and feedback to Habitat

These are tentative dates based on current time constraints and expected time of receiving the SEA for review. Once a Chair is selected he/she will have input into this schedule.

Attached are 4 background documents:

- A. Map of the area
- B. Original Scoping document
- C. 2003 DFO Science (NL Region) review and comments of the second draft of the Laurentian Subbasin

Strategic Environmental Assessment (SEA)

D. 2003 DFO Science (Maritimes Region) review of the draft of the Laurentian Subbasin Strategic Environmental Assessment (SEA)

C. 2007 DFO Science (NL and Maritimes Region) review of the Sydney Basin Offshore Area Strategic Environmental Assessment (SEA) - Draft 2 (+ appendix)

The Laurentian Subbasin and Sydney Basin Offshore Area are included within this current SEA.

If you have any questions about this process please let me know. Tana Worcester is the CSAS contact for the Maritimes.

Thanks,
Vanessa

Vanessa Sutton-Pande
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Fisheries and Oceans Canada
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<< File: SA1037 Study Area Figure.doc >> << File: SCBasins SEA_scope_dft_rev1_081219.doc >> << File: SEA draft 2 sigrid.doc >> << File: Laurentian SEA Comments.doc >> << File: DFO Response to Sydney Basin SEA-Draft 2appendix.doc >> << File: DFO Response to Sydney Basin SEA-Draft 2.doc >>

Templeman, Nadine

From: Ollerhead, Neil
Sent: September-10-09 10:47 AM
To: Templeman, Nadine
Subject: SEA Comments

Nadine

I had some specific comments regarding a couple of the maps in the report as well as some of how my work on spawning and juvenile distributions had been cited. Here goes....

Section 2.2.1

- Figure 2.17 shows the bathymetry of the SEA Area but I can't find where they cite the source of the data. Also, in section 7.1 of the scoping document they state that the SEA Area extends to the 4000m contour without listing a source for the bathymetric data. Is it from a commercially available dataset, from a combination of datasets or from a CHS survey? I don't know if I missed this in the document but I think it would be a good question to ask and to get some clarification.

Section 2.3.3.4 – Iceberg Drift

- Figure 2.36
 - The figure illustrating the iceberg drift patterns do not match the text describing the general drift patterns. I think this is just a simple desktop publishing error but nonetheless should be corrected.

Section 3.2.1.1

- Iceland Scallops
 - In the second paragraph they say '...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...' and cite Ollerhead et al 2004. The report states explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. The reference to maturity should be removed.

Section 3.2.1.2

- Redfish
 - Fourth paragraph, first line, should read 1998-2002 not 1995-2002
- Haddock
 - Second paragraph states '...however, recent surveys have not shown spawning occurring in the SEA Area...' again citing Ollerhead et al. 2004. This is wrong. The maps showing the April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring in the SEA Area.

I hope this is what you were looking for. If there is anything else let me know.

Later,
Neili

Abbott, Melissa H

From: Herbert, Glen
Sent: Friday, September 11, 2009 5:45 PM
To: Abbott, Melissa H
Cc: Curran, Kristian; Ford, Jennifer
Subject: RE: SN Strategic Environmental Assessment

Hi Melissa,

Below is some information on our AOI process that should be referenced in the SEA. Also attached is a map of the AOI study areas referred to in the text. Text for a caption is provided below.



StudyAreas8_nu...

Figure X. Study areas created from the mapping of ecological priority areas on the Scotian Shelf. In 2009, a subset of these areas will undergo public consultation to choose one Area of Interest (AOI) to become a Marine Protected Area under the *Oceans Act*. While only one of these areas will become an AOI in the short term, the mapping of ecological priority areas will serve as the foundation for a marine protected area network in the region. This work builds on the work to identify EBSAs in the region, but uses a more data-driven approach. The sites are referred to as: 1) Sydney Bight, 2) St Anns Bank, 3) North of Canso Bank, 4) Misaine Bank and Eastern Shoal, 5) Middle Bank, 6) the Gully Trough, 7) Shortland and Haldimand Canyons and Slope, and 8) the Northern Spur.

The three study areas adjacent to and/or partially within the Southern Newfoundland SEA area are St. Anns Bank, Misaine Bank and Eastern Shoal, and Shortland and Haldimand Canyons and Slope.

Misaine Bank & Eastern Shoal

Misaine Bank is unique compared to other banks on the Scotian Shelf because its surface was carved into deep channels by glaciers more than 10,000 years ago. This study area includes parts of Artimon Bank, the Laurentian Channel, and the Eastern Shoal on Banquereau. These features provide important habitat for many different fishes and other animals, including redfish, snow crab, skates, sculpins, and shrimp. Fragile and long-lived deep sea corals and sponges have also been found in several parts of the area. The area is an important habitat to several at-risk or depleted species, including winter skate, Atlantic cod, and two species of wolffish. Many species of fish and whales migrate through this area, especially along the shelf edge into the Laurentian Channel, where they feed on krill and other prey.

St Anns Bank

This area includes St Anns Bank, Scatarie Bank, and a portion of the Laurentian Channel. Many species migrate through the St Anns Bank study area including fishes like herring and bluefin tuna and the endangered blue whale, along with other whales, porpoises, and dolphins. Endangered leatherback turtles feed in this area during the late summer and early fall. Atlantic cod from the Gulf of St Lawrence, which are currently at very low numbers, use parts of this area in the winter when shallower Gulf waters are too cold. The area is also important habitat for Atlantic wolffish – another at-risk species. Finally, corals and sponges can be found in the deeper parts of the area.

Shortland and Haldimand Canyons and Slope

This area of the Scotian Shelf Slope features Shortland Canyon and Haldimand Canyon, both of which are known to be important habitat for the endangered Northern bottlenose whale and support significant concentrations of large branching cold-water corals. This slope area consistently shows a high biodiversity relative to other parts of the Scotian Shelf, and provides important habitat to a number of species including halibut, thorny skate, and redfish. Finally, the Stone Fence, one of the most important areas to corals in the region, is found in this area, at the “corner” where the Laurentian Channel turns into the shelf slope. The only records of living *Lophelia pertusa*, a reef-forming deep-water coral, in the Maritimes are from this area. This prompted the creation of the Lophelia Coral Conservation Area in 2004, which restricts all bottom fisheries for the protection of corals.

Do you know if we will see this document again after the input from the regulatory and stakeholder review is completed? In addition to our interest in the actual recommendations of the SEA, we expect a decision on which of the above study areas will proceed to AOI status later this fall. I am not sure of the timing for the SEA completion relative to this.

I have cc'd Jen Ford, who provided the text and map, and Kristian Curran, our regional oil/gas lead with Environmental Assessment and Major Projects for their records.

Hope this is useful,
Glen

Glen Herbert
Oceans and Coastal Management Division
Fisheries and Oceans Canada (Maritimes Region)
5th Floor Polaris Building, Mail Stn B500
Bedford Institute of Oceanography
Dartmouth, Nova Scotia, B2Y 4A2
(Tel) 902 426-9900
(Fax) 902 426-3855
glen.herbert@dfo-mpo.gc.ca

From: Abbott, Melissa H
Sent: August 21, 2009 12:33 PM
To: Herbert, Glen
Subject: SN Strategic Environmental Assessment

Hi Glen

I am part of a working group that is reviewing the C-NLOPB's Southern Newfoundland Strategic Environmental Assessment. (SN SEA) draft report. A small portion of the SEA study area falls within ESSIM boundaries, and it as well borders it.

If you would like to review and provide any comments, could you please forward them to me, by September 11, 2009, so I can roll them up with other comments I will be receiving.

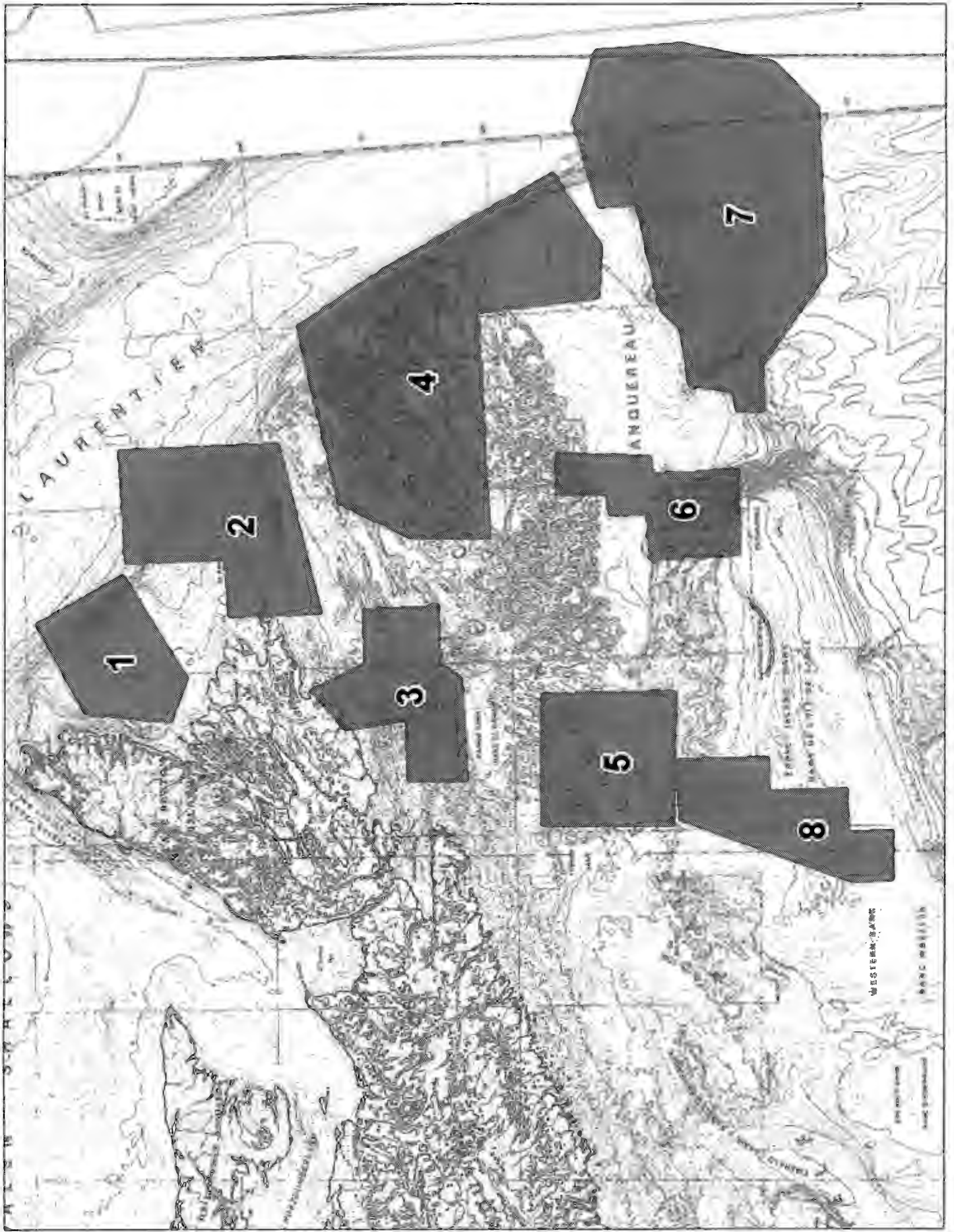
I am going to send you an electronic copy (CD) of the draft, and I have included the scoping document for this project (as an attachment). If you have any questions, or would like any additional background information, please let me know

<< File: SCBasins SEA_scope FINAL Jan 30 2009.doc >>

Melissa Abbott
Oceans Biologist
Oceans, Habitat, & Species at Risk
Fisheries and Oceans Canada
PO Box 5667, St. John's, NL
A1C 5X1

(T) 709-772-6270
(F) 709-772-3578

(Email) melissa.abbott@dfo-mpo.gc.ca



Templeman, Nadine

From: Dwyer, Karen
Sent: September-11-09 4:00 PM
To: Templeman, Nadine
Cc: Power, Don
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11
Attachments: SNL SEA comments.doc

Hi Nadine

Here are my comments. I hope they are useful/what you were looking for. Let me know if you need clarification. Have a good weekend. I am glad it's Friday though it was a short week!

Karen

From: Templeman, Nadine
Sent: Thu 10/09/2009 23:11
To: Sutton-Pande, Vanessa; Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Gilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana
Cc: Clarke, Keith
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Much appreciate all the efforts,
Have a wonderful weekend ~

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

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Sent: Monday, August 31, 2009 9:38 AM
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Cc: McCallum, Barry; Tillman, Joe; Clarke, Keith; Parsons, Jay; Sutton-Pande, Vanessa
Subject: CONFIRMATION - Deadline for SNL SEA Review

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Please contact me if you have any questions or concerns on this, or anything else regarding the review.

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Fisheries and Oceans Canada / Pêches et Océans Canada

Science Branch / Direction des sciences

Environmental Sciences Division / Division Environnementale Des Sciences

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Please note: new email format above

Section 3.2.1.2 Finfish

Witch flounder

This section has no information on the witch flounder stock that resides in Div. 3O. It discusses only the Div. 3Ps stock. A few sentences should be inserted on the life history/distribution of the stock in this area (Div. 3O).

Section 3.2.6 Data Gaps

The section is generally poorly organized, with not much detail. Suffice to say many data gaps exist but more information might be added.

Section 3.3.1.1 Commercial Fisheries Overview

Historical Fisheries in the SEA Area

Editorial comment: In the last sentence on p. 104 that starts with “In Subdivision 4Vs...” the word “where” can be removed from the sentence.

Section 3.3.1.2 SEA Area Commercial Harvest, 2000-2007

Fishing Enterprises and Licenses

If not described elsewhere in the document, it might be useful to briefly describe the different type of licenses discussed in this section.

Groundfish

Yellowtail Flounder

Figure 3.30. The 2006 value is low. It should be mentioned in the text why that value is unusually low (industry restructuring).

American plaice

Figure 3.45 I believe this figure is incorrect, at least comparing values in the figure to those in the text. Is the figure describing American plaice harvest in Div. 3O only and the text describing something else? The text should be on par with the figure, and if not, should be explicit in its interpretation.

Section 3.7

Species at Risk

Editorial: There is a parenthesis missing after “COSEWIC” in the second line.

I had a comment that Schedules 1-3 should be explained in the second paragraph, but they are explained in the following paragraph, which is fine.

Table 3.20 American plaice (NL population) has a footnote “a” after NL, but I do not see what the footnote actually is.

Section 3.7.1.10 American plaice

Editorial: Third line of the second paragraph: “occurs” should be “occur”

While the statement “Plaice are typically found at depths of approximately 90-250 m, but have been found as deep as 713 m.” is not incorrect, the following is more correct: “Plaice are typically found in depths less than 713 m, and as least as deep at 1300 (Morgan and Bowering 2006).”

Finally there is a lot of information on spawning and life history characteristics of the plaice in Div. 3Ps but there is no information on plaice in Div. 3O (especially since it is pointed out there is minimal intermingling of adults).

I only glanced at the last 3 chapters. I did not feel confident commenting on the information in these chapters.

Templeman, Nadine

From: Stansbury, Don
Sent: September-11-09 10:20 AM
To: Templeman, Nadine
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11
Attachments: General Comments on LGL SEA.doc

See comment attached.

Don S.

From: Templeman, Nadine
Sent: Thursday, September 10, 2009 11:11 PM
To: Sutton-Pande, Vanessa; Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Gilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana
Cc: Clarke, Keith
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Have a wonderful weekend ~

Nadine.

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Cc: McCallum, Barry; Tillman, Joe; Clarke, Keith; Parsons, Jay; Sutton-Pande, Vanessa
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Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Fisheries and Oceans Canada / Pêches et Océans Canada

Science Branch / Direction des sciences

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E-mail / E-mail: nadine.templeman@dfo-mpo.gc.ca

Please note: new email format above

General Comments:

Please provide a map displaying place names that are referenced in the document. Locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon are not commonly referenced. Also there is an inconsistent treatment of the use of scientific names.

Specific Comments:

Page 70/ 3.2.1.1 Snow Crab:

The comment on commercial catch per unit of effort (CPUE) is incorrect. The 2008 SAR which is cited states, “CPUE changed little during 2004-2006 before **decreasing** in 2007. In the most recent SAR 2009/045 states “CPUE has declined since 2002, to its lowest level in 2008”. Also, citing DFO 2008b is inappropriate here.

Page 70/ 3.2.1.1 Sea Scallop:

Delete “Newfoundland’s large offshore banks”. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Page 71/ 3.2.1.1 Iceland Scallop:

Citation DFO 2006b should read 2006d.

This document cites Ollerhead et. al 2004 for spawning time of Iceland scallop on St. Pierre Bank. However, Ollerhead was somewhat general and not site specific as this test would have you believe. In fact, Ollerhead statement is “Iceland scallop are known to spawn in the late summer” and cites a DFO – Science, Stock Status Report C4-07. Scallops in Quebec inshore waters 14p.

Page 72/ 3.2.1.1. Orange footed Sea Cucumber:

The authors provide the global distribution but do not make any comment on the distribution within the SEA Area.

Page 86/ 3.2.4.1 Catch Weight.

This section and its table 3.3 have no merit. Given that the sampling trawl has different catch efficiency for various species, makes comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would help table 3.3 on page 91.

Page 102/ 3.2.6 Data Gaps

The comment “last full assessment” is ambiguous. Although this comment is lifted from the cited DFO SAR, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank. The cited DFO doc. is the latest assessment for this region of the SEA. The authors are correct however, that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

Page 102/ 3.3 Fisheries

3Pn, 3Ps and 4Vs are NAFO sub-divisions not Divisions.

Page 105/ Figure 3.14

Quantity: Numbers or weights

Page 106/ table 3.4 and Page 146

The value of Sea Scallop average harvest differs from the table and the text on page 146. 1867.4 t (table) not equal to 280 t (text). Figure 3.65 on page 146 does not reflect the value in the text. Also, the values in Figure 3.65 differ from those found on the Quota Reports provided by Fisheries & Oceans Canada, Commercial Statistical Services and in DFO 2007/006.

DFO, 2007. Sea Scallop Status on the St. Pierre Bank. DFO Can. Sci. Advis. Sec. Sci. Resp. 2007/006

Templeman, Nadine

From: Simpson, Mark R
Sent: September-11-09 8:09 AM
To: Templeman, Nadine
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Nadine. I have reviewed the Marine Fish SARA portions of the document - in nearly every case the data is outdated by at least two years and needs to be revised - the general biological details for the various species presented are relatively accurate.

Mark

From: Templeman, Nadine
Sent: Thursday, September 10, 2009 11:11 PM
To: Sutton-Pande, Vanessa; Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Wilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana
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Have a wonderful weekend ~

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

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Sent: Monday, August 31, 2009 9:38 AM
To: Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Wilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana
Cc: McCallum, Barry; Tillman, Joe; Clarke, Keith; Parsons, Jay; Sutton-Pande, Vanessa
Subject: CONFIRMATION - Deadline for SNL SEA Review

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Facsimile / Télécopieur: (709)772-5315

E-mail / E-mail: nadine.templeman@dfo-mpo.gc.ca

Please note: new email format above

Templeman, Nadine

From: Power, Don
Sent: September-13-09 5:03 PM
To: Templeman, Nadine
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11
Attachments: SEA comments DPower.doc

Hi Nadine,

Here are my comments as promised. Just to note I will be leaving for a NAFO meeting in Norway on Tuesday and won't return until the 28th. So, I'll miss the conference call on this.

Thanks,
Don

From: Templeman, Nadine
Sent: Friday, September 11, 2009 12:38 PM
To: Power, Don
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Not a problem Don ~ the main thing is that I know what is coming as I work on the comments I already have. Monday morning will be fine...thanks for the heads up!
N.

From: Power, Don
Sent: Friday, September 11, 2009 11:46 AM
To: Templeman, Nadine
Cc: Sutton-Pande, Vanessa
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Hi Nadine,

I'm going to be reviewing the SEA this afternoon. In the likely chance that I can't complete it, would you be willing to take my comments first thing Monday morning?

Don

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Nadine.

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Please note: new email format above

Page 73: 3rd Paragraph (Redfish section):

“....and(3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.])...”

Should be “...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]...”

Page 73: 3rd Paragraph (Redfish section):

*“The importance of addressing the issue of redfish stock definition and boundaries...
....Fisheries Resource Conservation Council.”*

This is a quite dated statement and there is more recent information to address this. See http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2008/SAR-AS2008_026_E.pdf

Page 73: 4th Paragraph (Yellowtail flounder section):

“Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank.”

The majority of catch of yellowtail (since 2000, about >10000 t except for 2006 and 2007) come from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e. St. Pierre Bank).

Page 77: 7th Paragraph Greenland Halibut Section

There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is not in the SEA area but no references to the Subarea 2 + Div. 3KLMNO stock (assessment by NAFO) whereas Div. 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area remains a separate entity (located in between) the stocks mentioned above that are assessed and the linkages remain largely unknown.

Page 78: 5th Paragraph (Witch flounder section)

“These relatively non-migratory flatfish....(primarily in 45-275 m depth range)...”

Witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantique/witch-plie-eng.htm)

Page 86: 2nd Paragraph (DFO RV surveys section)

The authors should provide a better description of the data used. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in adjacent 3O. Although it is

clear the authors combined the 2006 and 2007 data, it is not clear whether they used both spring and autumn data for 3O.

Page 86: 3rd Paragraph (Catch weight section)

“...They include deepwater redfish, thorny skate....”

Should remove “deepwater” from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. As it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

Page 86, 5th Paragraph (Planning Implications section)

“...Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...”

I suggest contacting Fisheries and Aquaculture Management Branch for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks.

Page 87-88, Table 3.2

More information needs to be added for Redfishes under “Timing of Spawning”, owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under “Eggs/Larvae” a better description on the chronology of the life history stages is available in the literature. Generally they are extruded at about 5mm in spring/summer, larvae are pelagic and free swimming until they settle on bottom at about 30mm.

Page 139, Paragraph 1 and Figs. (Hagfish Section)

There is a discrepancy between the landings indicated in the SEA versus what was used in the assessment of hagfish that was reported in the Science Advisory Report (SAR) conducted at an assessment in May 2009. For example, for 2006 the SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54). For 2007 the SAR indicates landings of about 300 t (about 980 t from Fig. 3.54).

Page 153, Paragraph 1 (Data Gaps Section).

The authors should also note here as well as at the beginning of the commercial fisheries section, that catches outside the 200-mile limit by foreign vessels are not included in the descriptions. Information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Templeman, Nadine

From: Collins, Roanne
Sent: September-14-09 9:43 AM
To: Templeman, Nadine
Subject: RE: SNL SEA - Posting and Instructions for Reviewers

Section 3.1.4.1 (p. 66), Deep Subtidal - Minor point but, unlike many other species, lobster is mentioned without reference to scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it might be useful to specify.

Section 3.2.1.1, Macroinvertebrates, American lobster - This section requires additional comment and clarification regarding the biennial molt-reproductive cycle. The document only addresses the fact that the female carries embryos under her tail for 9-12 months. It does not make mention of the fact that she broods the eggs internally for a year beforehand. This makes the reference to the two-year cycle confusing.

Table 3.2, lobster - explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 week pelagic stage"

Table 3.24 (p. 231) - Penguin Islands is also the site of an American lobster reserve/closed area.

Section 3.3.6, Data Gaps (also, 6.3) - The Sydney Basin SEA Study Area includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. Georeferenced commercial data is not available, as the document already mentions.

Section 4.5.1.2, Sound Detection and Production, (p. 256) - American lobster also produce sounds, and a reference to research for *Homarus* species might also be useful, since *Panulirus* species are not found in NL waters.

Section 4.6.4.2, Fish - Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and molting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

Roanne Kyla Collins
Research Biologist (Lobster) / Biologiste de recherche (Homard)

Fisheries and Oceans Canada / Pêches et Océans Canada
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Facsimile: 709-772-4105

From: Templeman, Nadine
Sent: Friday, August 21, 2009 11:07 AM
To: Dwyer, Karen; Healey, Brian; Morgan, Joanne; Murphy, Eugene; Parsons, Dawn; Power, Don; Simpson, Mark R; Sjare, Becky; Stenson, Garry; Bourgeois, Chuck; Dawe, Earl; Stansbury, Don; Collins, Roanne; Pepin, Pierre; Morris, Corey; Gilkinson, Kent; Anderson, M. Robin; Payne, Jerry F; Ollerhead, Neil; Stirling, Charles; Mabrouk, Gehan; Wheeler, John; Worcester, Tana; Mowbray, Fran; Nakashima, Brian; Han, Guoqi
Cc: Parsons, Jay; McCallum, Barry; Clarke, Keith; Sutton-Pande, Vanessa
Subject: SNL SEA - Posting and Instructions for Reviewers

Good day everyone,

The SNL SEA arrived yesterday and has now been posted to the shared folder (\\nflwhhfs01\Science Info\CSA Review\Review of SEA for Southern NL). You should all now be able to access this document through permissions for this folder and/or the online link (http://www.cnlopb.nl.ca/env_strategic.shtml#Current) at CNLOPB.

In keeping with its commitment to regularly update SEAs, the CNLOPB is seeking to update the SEA for the Laurentian Subbasin (2003), and the SEA for the Sydney Basin (2007) (where necessary) to be included with the new assessment of an area east of the Laurentian Subbasin. Further information on the Background, Area, Objectives, and intended Scope of the SEA can be found within the Southern Newfoundland SEA Scoping Document (attached and online).

Also for your information and assistance, comments from the previous reviews have also been posted to the shared folder and are attached to the initial email you received from Vanessa (below) several weeks ago.

INSTRUCTIONS FOR REVIEW:

- Please read the Southern Newfoundland SEA Scoping Document for guidance on expectations for the SEA.
- Science review of the SEA will focus on the identification of data gaps, inaccuracies, and inconsistencies.
- Please provide comments back to me by Section # (i.e., Section 3.2.2 – “comment”)

At this point I will be drafting the SSRP response from the collated comments (couple of days or so)

- Reviewers to review draft SSRP – participate in conference (with Maritimes) call on comments if required

I will finalize the SSRP document based on comments from the draft, obtain Regional approval, and send our response to Habitat for the deadline.

TIMELINES:

The original timeline for completing the review is below:

August 17 - September 11	19 working days	Review of SEA and submission of written comments
September 11-18	5 working days	Chair to draft SSRP document and distribute to reviewers
September 21-28	5 working days	Conference call to discuss draft Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers
September 29	1 day	Regional approval of SSRP document and feedback to Habitat

However, we have since learned that CNLOPB has moved the deadline for delivery to **September 16**. **We continue to work on this - and will send an updated timeline if required (but hopefully not!!)**

Please contact me if you have any questions or concerns on this, or if you are unable to access the shared folder.

Nadine Templeman

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

From: Sutton-Pande, Vanessa
Sent: Friday, August 07, 2009 2:54 PM
To: Dwyer, Karen; Healey, Brian; Morgan, Joanne; Murphy, Eugene; Parsons, Dawn; Power, Don; Simpson, Mark R; Sjare, Becky; Stenson, Garry; Bourgeois, Chuck; Dawe, Earl; Stansbury, Don; Collins, Roanne; Colbourne, Eugene; Pepin, Pierre; Morris, Corey; Gilkinson, Kent; Anderson, M. Robin; Payne, Jerry F; Ollerhead, Neil
Cc: Mabrouk, Gehan; Parsons, Jay; Tillman, Joe; Mercer, Stephen G; Worcester, Tana; Grant, Carole; Meade, James; Maillet, Gary; Helbig, James; Senciall, Dave; Wheeler, John
Subject: SEA for Southern NL

Hello Everyone,

You are receiving this e-mail because you have been identified for the Science review of the Strategic Environmental Assessment (SEA) for Southern NL. For those sections that a specific reviewer has not been identified I would ask that Section Heads circulate as appropriate.

In response to the upcoming request for Science advice for the SEA for Southern NL, Science NL Region and Maritimes Region will be providing feedback to Habitat through a Science Special Reponse Process (SSRP). One published report will be produced from this process. A Chair will be selected for this process. We are looking at 1 of 2 options:

1. Circulation of SEA, a request for written input, chair to draft document and subsequent call to review the document.
2. Circulation of SEA, a request for written input, subsequent call to discuss, chair to draft document and second call to finalize document.

This is not a Regional Advisory Process (RAP). However, it is different than the route we have been providing Science advice for these requests (most recently) because a CSAS report will be produced and posted to the CSAS website under the SSRP series. The production of this document will include a collation of all comments and review (via conference call with Maritimes Region) of the Science comments provided. This process is intended to take place in the same timeframe as previous reviews. Therefore, it is important that responses are sent to the Chair by the timelines that we have been placed under.

We currently expect to receive the SEA from Habitat **August 17th**. This will likely be circulated via CD's or shared drive. The following is the tentative schedule for completion of this process for option 1:

1. August 17th - September 11th: Review of SEA and submission of written comments
2. September 11-18: Chair to draft SSRP document and distribute to reviewers
3. September 21 - 28th - conference call to discuss draft and Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers
4. September 29th - Regional approval of SSRP document and feedback to Habitat

The following is the tentative schedule for completion of this process for option 2:

1. August 17th - September 11th: Review of SEA and submission of written comments
 2. September 14 or 15th: Conference call to review comments
 3. September 16- 28th - Chair to draft SSRP document and distribute to reviewers, followed by 2nd conference call to finalize SSRP document
 4. September 28th - Regional approval of SSRP document and feedback to Habitat
- These are tentative dates based on current time constraints and expected time of receiving the SEA for review. Once a Chair is selected he/she will have input into this schedule.

Attached are 4 background documents:

- A. Map of the area
- B. Original Scoping document
- C. 2003 DFO Science (NL Region) review and comments of the second draft of the Laurentian Subbasin Strategic Environmental Assessment (SEA)
- D. 2003 DFO Science (Maritimes Region) review of the draft of the Laurentian Subbasin Strategic Environmental Assessment (SEA)

C. 2007 DFO Science (NL and Maritimes Region) review of the Sydney Basin Offshore Area Strategic Environmental Assessment (SEA) - Draft 2 (+ appendix)
The Laurentian Subbasin and Sydney Basin Offshore Area are included within this current SEA.

If you have any questions about this process please let me know. Tana Worcester is the CSAS contact for the Maritimes.

Thanks,
Vanessa

Vanessa Sutton-Pande
A/ Coordinator, Centre for Science Advice (CSA)
Fisheries and Oceans Canada
Newfoundland & Labrador Region
Northwest Atlantic Fisheries Centre
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<< File: SA1037 Study Area Figure.doc >> << File: SCBasins SEA_scope_dft_rev1_081219.doc >> << File: SEA draft 2 sigrid.doc >> << File: Laurentian SEA Comments.doc >> << File: DFO Response to Sydney Basin SEA-Draft 2appendix.doc >> << File: DFO Response to Sydney Basin SEA-Draft 2.doc >>

Abbott, Melissa H

From: Alexander, David
Sent: Tuesday, September 15, 2009 4:18 PM
To: Abbott, Melissa H; Mullins, Conrad
Subject: RE: SN Strategic Environmental Assessment

s.19(1)

Melissa

I thought I would send this along and Conrad can further comment

The Southern Newfoundland SEA borders the GOSLIM LOMA boundary at the most southerly point within the Cabot Strait (NAFO 4R boundary), which encompasses the West Coast of Newfoundland EBSA (10) and the Bay St. George/Port au Port Peninsula Coastal Management Area.

Two major concerns from a GOSLIM perspective would involve the impacts on migratory marine species that utilize the area of the proposed SEA; and interaction between oil and gas operations and the physical elements of the marine area within the Cabot Strait.

From a physical perspective, the Labrador Current generally moves westward along the south coast of the Island of Newfoundland and then northward into the Gulf of St. Lawrence. Winds are predominantly westerly, blowing onshore from the west/southwest during the summer months and west/northwest for much of the winter. Ice cover along the southern most portion of the West Coast is minimal (<60 days).....AMEC Earth and Environmental Limited, 2001. Biophysical Overview of Western Newfoundland and Southern Labrador.

The Bay St. George/Port au Port Peninsula Coastal Management Area encompasses St. George's Bay, an important spring and fall spawning/feeding area for Atlantic herring and migration/staging area for Atlantic salmon. The lobster fishery is also a significant economic driver for communities in the area. The Grand Codroy Estuary is an important staging/nesting area for migrating waterfowl and shorebirds including the endangered Piping plover.

Atlantic cod, redfish and other marine species use the Esquiman Channel including the Cabot Strait escarpment as a principal migration corridor. Dense concentrations of Atlantic cod are known to overwinter in NAFO Area 3PN (within the Southern Newfoundland SEA), migrating along the Equiman Channel and northern GSL in the spring to spawn and returning in the fall.....DFO, 2006. Ecologically and Biologically Significant Areas (EBSA) in the Estuary and Gulf of St. Lawrence: identification and characterization. DFO Can. Sci. Advis. Sec., Sci. Adv. Rep. 2007/016.

Given the compounding effect of ocean currents, winds and lack of ice cover; there is increased potential for a spill to impact on coastal and marine habitat and species along Western Newfoundland. There are probably some data gaps to fill regarding the impacts of various stages of operation on migratory species.

Cheers,
Dave

From: Abbott, Melissa H
Sent: Tuesday, September 15, 2009 10:37 AM
To: Alexander, David; Mullins, Conrad
Subject: RE: SN Strategic Environmental Assessment

I have comments about EBSAs/AOIs from a PBGB and ESSIM perspective and as well in regards to CMAs over here..I need any comments relating to GOSLIM from you guys

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s.19(1)

(Email) melissa.abbott@dfo-mpo.gc.ca

From: Alexander, David
Sent: Tuesday, September 15, 2009 10:32 AM
To: Abbott, Melissa H; Mullins, Conrad
Subject: RE: SN Strategic Environmental Assessment

Hi Melissa

[REDACTED] I talked to Conrad on this last week and we both suggest that EBSAs and AOIs should be clearly identified in the SEA. I can see that this has been highlighted in the scoping document under sensitive areas.

Also, attached is an article that I stumble upon about a year ago.....it makes reference to an important breeding area for porbeagle sharks off southern Newfoundland. Science should have some knowledge of this at NAFC.

<http://www.cbc.ca/technology/story/2008/07/21/shark-breeding.html>

Cheers,
Dave

From: Abbott, Melissa H
Sent: Tuesday, September 15, 2009 9:42 AM
To: Abbott, Melissa H; Mullins, Conrad
Cc: Alexander, David
Subject: RE: SN Strategic Environmental Assessment

Hi guys
Wondering if you had any comments

Melissa Abbott
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(Email) melissa.abbott@dfo-mpo.gc.ca

From: Abbott, Melissa H
Sent: Friday, August 21, 2009 1:14 PM
To: Mullins, Conrad
Cc: Alexander, David
Subject: FW: SN Strategic Environmental Assessment

Hi Conrad

I am part of a working group that is reviewing the C-NLOPB's Southern Newfoundland Strategic Environmental Assessment. (SN SEA) draft report. I am not sure if any of the study area falls within GOSLIM but at the very least it does border it.

If you (or Dave) would like to review and provide any comments, could you please forward them to me, by September 11, 2009, so I can roll them up with other comments I will be receiving.

I am going to send you an electronic copy (CD) of the draft, and I have included the scoping document for this project (as an attachment). If you have any questions, or would like any additional background information, please let me know

<< File: SCBasins SEA_scope FINAL Jan 30 2009.doc >>

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Templeman, Nadine

From: Worcester, Tana
Sent: September-15-09 9:27 PM
To: Templeman, Nadine
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11
Attachments: General Comments.doc

Hi Nadine. Here are some initial comments on the NL SEA for consideration. There was a lot less relevant from the Maritimes Region than expected, hence the limited scope of comments. It may be easier to provide additional comments and review once there is a draft SSR developed (so that we know where we might be able to contribute some additional information or insight). Also, timing hasn't been great on this one...

Tana Worcester
Coordinator, Advisory Services
Centre for Science Advice - Maritimes Region (DFO) Bedford Institute of Oceanography
1 Challenger Drive, Dartmouth, NS.
P: (902) 426-9920
F: (902) 426-5435

-----Original Message-----

From: Templeman, Nadine
Sent: September 11, 2009 2:21 PM
To: Worcester, Tana
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Not a problem Tana ~ I have been busy incorporating other comments that have been coming in, and actually it has been at a nice pace, so I am good.
Have a great weekend!
N.

-----Original Message-----

From: Worcester, Tana
Sent: Friday, September 11, 2009 2:46 PM
To: Templeman, Nadine
Subject: Re: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Hi Nadine. It's been a bit hectic this week, so I won't be able to send you the comments until Monday. Hope that's ok!

-----Original Message-----

From: Templeman, Nadine
To: Sutton-Pande, Vanessa; Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Gilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana

CC: Clarke, Keith
Sent: Thu Sep 10 22:41:00 2009
Subject: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Hi folks,

Just a friendly reminder that TODAY is the requested deadline for submitting your comments on the SNL SEA. I have already begun inserting comments into the draft SSRP document from those that I have received to date in hopes of getting the draft document out as early as possible next week for your review.

It would be much appreciated that if you do have comments that you feel you won't be able to get to me today, that you drop me a line to let me know that they will be outstanding so I can anticipate their arrival early next week.

Much appreciate all the efforts,
Have a wonderful weekend ~

Nadine.
Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

From: Templeman, Nadine
Sent: Monday, August 31, 2009 9:38 AM
To: Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Gilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana
Cc: McCallum, Barry; Tillman, Joe; Clarke, Keith; Parsons, Jay; Sutton-Pande, Vanessa
Subject: CONFIRMATION - Deadline for SNL SEA Review

Good morning everybody,

I just wanted to update you on the status of the timeline for completing the review of the SNL SEA.

In sharing our concerns on the proposed shortened timeline for submission of comments, OHSAR Branch has contacted the CNLOPB and informed them that we will only be able to provide comment in the originally agreed upon timeline. This means that the deadline for submitting comments to CNLOPB will remain at September 30 and we will be following the original timeline for Science Review below :

August 21 - September 11

16 working days

Review of SEA and submission of written comments

September 11-18

5 working days

Chair to draft SSRP document and distribute to reviewers

September 21-28

5 working days

Conference call to discuss draft

Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers

September 29

1 day

Regional approval of SSRP document and feedback to Habitat

Please submit your written comments on the draft SEA to me by **September 11**** so we can move forward as laid out in the schedule above.**

Also, thank you to those who have submitted comments already.

Please contact me if you have any questions or concerns on this, or anything else regarding the review.

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

**Fisheries and Oceans Canada / Pêches et Océans Canada Science Branch / Direction des sciences
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(709)772-5315 E-mail / E-mail: nadine.templeman@dfo-mpo.gc.ca <mailto:nadine.templeman@dfo-
mpo.gc.ca>**

Please note: new email format above

General Comments

In general, there is not a lot of information from the Maritimes Region contained within this SEA. Information that is provided does seem to be reasonably accurate and complete. Further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

2.2.1 Currents

In general, the description provided is good. A few of the details could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank. Also, Han's assessment of how barotropic the flow was might be related with the choice of upstream boundary conditions.

In Figure 2.16, the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. However, this may not be particularly relevant to the study area.

In Figure 2.17, additional labels would be helpful for banks (bathymetry) in Maritimes Region.

2.3 Ice

Suggestion in the review of the Laurentian SEA to make use of the Canadian Ice Services database was taken and applied here.

2.4 Bathymetry

Once again, place names and identifying features are presented only with the actual SEA area, though areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified here.

2.5 Geology

A good description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (in this section or in the planning implications).

2.7 Planning Implications

Physical Oceanography – It is not clear from this description why so much effort was put into describing the temperature profiles of the region. While not explicitly stated, this

section seems to imply that knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Linkages between ocean currents and spill or discharge trajectories are not made in this section. Rationale for inclusion of temperature and salinity information is not strong, but could be strengthened.

Mention could be made here of the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.1 Fish Habitat

It is unclear why zooplankton and phytoplankton are considered fish habitat here and elsewhere.

3.1.3 Plankton

AZMP results presented from the Maritimes Region are consistent with the latest advisory report.

3.1.4 Benthic Invertebrates

It would be useful to include a map showing the location of the Stone Fence (with other coral areas).

The review of the Laurentian Subbasin SEA suggested inclusion of results from DFO RV surveys to provide information on distribution of benthic invertebrates, as well as results from the DFO Banquereau clam dredging experiment and comparisons with other areas.

3.1.5 Planning Implications

Direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

No mention is made in this section of crab species other than snow crab, such as stone crab, red crab, toad crab. However, toad crab and rock crab are mentioned in the list of characteristic deep subtidal invertebrate species.

No mention is made of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank).

More recent information on pollock from the Maritimes Region is available in the following references:

- DFO. 2009. Pollock in Div. 4VWX+5. DFO Can. Sci. Advis. Sec. Sci. Advis. Report. 2009/025.
- Stone, H., C. Nelson, D. Clark, and A. Cook. 2009. 2008 Assessment of Pollock in 4VWX+5. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/001. viii + 79 p.

The description of knowledge about Atlantic halibut spawning is perhaps overly confident. Saying that “it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$.” does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Spawning depths are not known with certainty. Also, the Gulf Atlantic Halibut Tagging Program is mentioned, but not the tagging program in 3NOPs4VWX5Zc, which may be more relevant. Results of tag/recaptures in NAFO units relevant to this SEA would be available.

More recent information has been published and is available for bluefin tuna (i.e., since 2001).

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is difficult to evaluate accuracy of landings from Maritimes Region from the way the information has been presented. Not all landings are georeferenced, so maps may be an under-representation. No mention is made of fisheries that may occur immediately adjacent to the SEA area and that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

3.7 Species at Risk

Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

3.8.1.2 ESSIM

Oceans from the Maritimes Region has provided comment to directly to Oceans in NL on this section.

4.5.1 Effects of Sound

This section appears to be very comprehensive. Much of the relevant literature has been considered.

4.5.1.1 Fish Habitat

It is interesting that this section includes discussion on zooplankton and benthic invertebrates but does not specifically mention corals.

4.5.2 Effects of Drilling Muds and Cuttings

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant.

Abbott, Melissa H

From: Herbert, Glen
Sent: Wednesday, September 16, 2009 11:49 AM
To: Abbott, Melissa H
Cc: Ford, Jennifer
Subject: Updated coral figure

Hi Melissa,

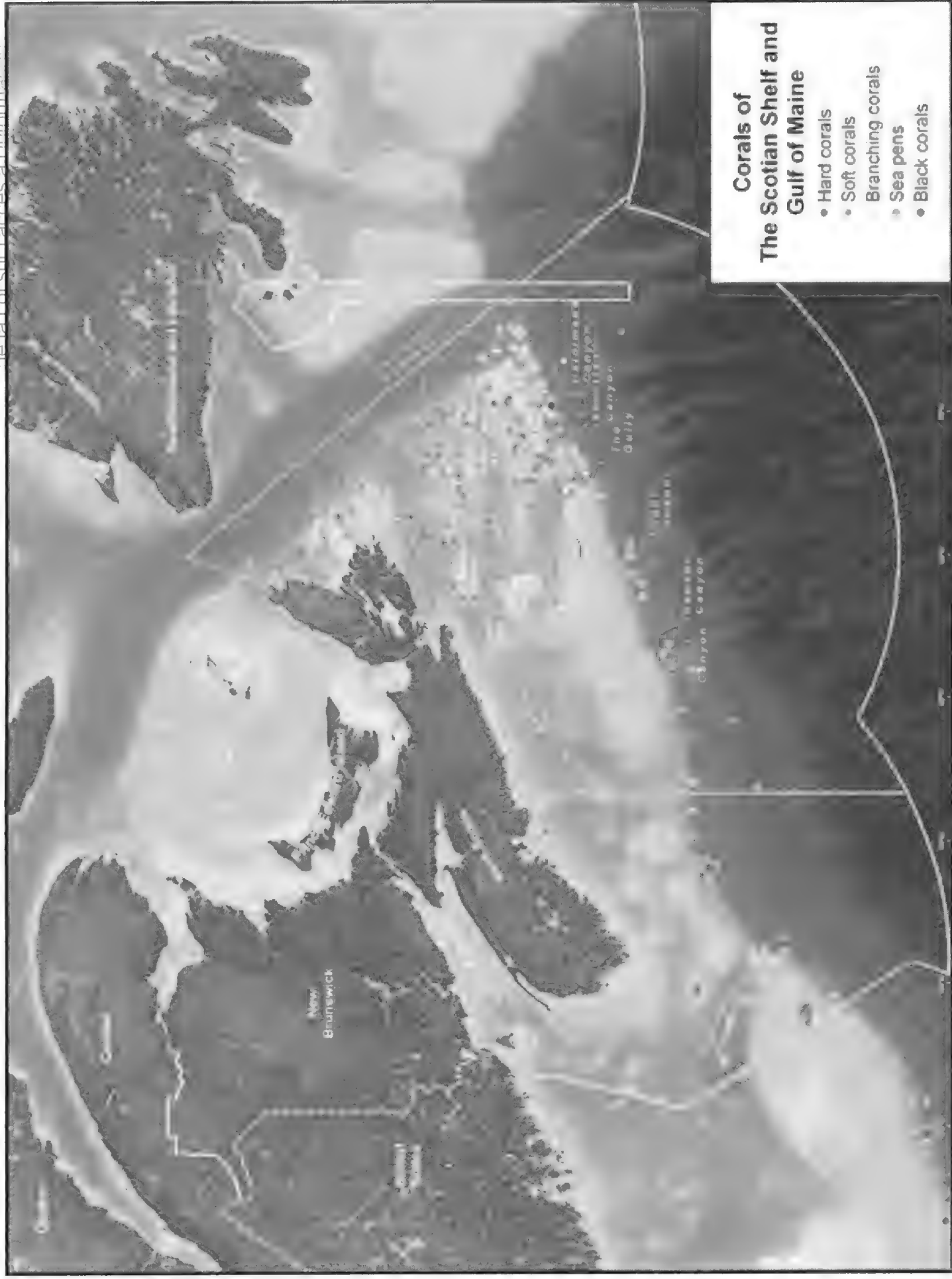
Please find attached an updated figure showing general coral locations. Feel free to provide this to the SEA writers.

The figure should be credited as follows: Benthic Ecology Group, BIO, DFO



ScotianShelfMa...

Glen Herbert
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Templeman, Nadine

From: Pepin, Pierre
Sent: September-16-09 12:07 PM
To: Templeman, Nadine
Subject: RE: SEA question

Nadine,

I generally agree. The SEA is rather "resource" centric rather than ecosystem centric. The latter is the more appropriate perspective.

Piere

From: Templeman, Nadine
Sent: September 16, 2009 12:01 PM
To: Pepin, Pierre
Subject: SEA question

Hi Pierre,

Going over comments from the Maritimes region, I was wondering what your thoughts are on the following statement wrt plankton -

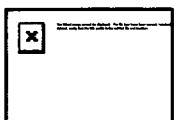
"It is unclear why zooplankton and phytoplankton are considered fish habitat here and elsewhere".

Agree or disagree? Or indifferent?!

Nadine.

Nadine Templeman
HOTO Biologist / Biologiste de HOTO
Fisheries and Oceans Canada / Pêches et Océans Canada
Science Branch / Direction des sciences
Environmental Sciences Division / Division Environnementale Des Sciences
P. O. Box 5667 / C. P. 5667
St. John's, NL / St. John's, Terre-Neuve
A1C 5X1
Telephone / Téléphone: (709)772-3688
Facsimile / Télécopieur: (709)772-5315
E-mail / E-mail: nadine.templeman@dfo-mpo.gc.ca

Please note: new email format above



Abbott, Melissa H

From: Mullins, Conrad
Sent: Thursday, September 17, 2009 11:34 AM
To: Abbott, Melissa H
Cc: Kuehnemund, Sigrid
Subject: RE: SN Strategic Environmental Assessment

Hi Melissa, I have reviewed the SEA document and my comments are attached.



Mullins

Comments on S...

Conrad

From: Abbott, Melissa H
Sent: Friday, August 21, 2009 1:14 PM
To: Mullins, Conrad
Cc: Alexander, David
Subject: FW: SN Strategic Environmental Assessment

Hi Conrad

I am part of a working group that is reviewing the C-NLOPB's Southern Newfoundland Strategic Environmental Assessment. (SN SEA) draft report. I am not sure if any of the study area falls within GOSLIM but at the very least it does border it.

If you (or Dave) would like to review and provide any comments, could you please forward them to me, by September 11, 2009, so I can roll them up with other comments I will be receiving.

I am going to send you an electronic copy (CD) of the draft, and I have included the scoping document for this project (as an attachment). If you have any questions, or would like any additional background information, please let me know

<< File: SCBasins SEA_scope FINAL Jan 30 2009.doc >>

Melissa Abbott
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September 17, 2009

**Comments on Draft Southern Newfoundland Strategic Environmental Assessment,
August 2009**

Section 2.7.2 (Page 55) – There is no mention of the planning implications of the ocean currents entering the Gulf of St. Lawrence (see Section 2.2.1.1). Ocean currents in the Gulf of St. Lawrence flow in a counter-clockwise direction and winds blow onshore (predominantly northwest to southerly winds) along the southwest and west coast for much of the year. Taking into account the enclosed nature of the Gulf of St. Lawrence and the cyclonic flow of ocean currents and predominant onshore winds, there is a high probability that an accidental oil spill originating in the SEA area would reach coastal areas of western Newfoundland and perhaps throughout the Gulf of St. Lawrence. In addition, while ice cover may not be an issue in the SEA area itself, pack-ice in the Gulf would complicate efforts of oil spill remediation.

Section 3.7.1.3 (Page 211) – The document makes mention of the fact that the Laurentian North population of Atlantic cod includes St. Pierre Bank and Northern Gulf of St. Lawrence cod. However, it fails to describe the important migration of cod (as well as other demersal species) that takes place between these two areas. Cod in the Northern Gulf of St. Lawrence and along the south coast of Newfoundland comprise an assemblage of stocks within which there is considerable mixing. They are currently at low levels as a group and overall have declined by about 80% over the past thirty years.

Section 3.8.2 (Page 225) – There is mention of the West Coast of Newfoundland EBSA immediately adjacent to the SEA area and a reference given (DFO 2007f). It should be noted that while not yet been published on the DFO CSAS website, further documentation does exist further describing conservation priorities within the West Coast of Newfoundland EBSA. The manuscript document may be obtained by contacting Gerald Chaput, DFO Moncton (506) 851-2022 or Gerald.Chaput@dfo-mpo.gc.ca. does not yet appear on the CSAS website.

Section 3.8.7 (Page 233) – The implications of the presence of Ecologically and Biologically Sensitive Areas within and adjacent to the SEA area seems inadequate.

Conrad Mullins

Coordinator, Oceans and Coastal Management

Oceans Division

Oceans, Habitat & Species at Risk Branch / Direction des océans, de l'habitat et des espèces en péril

Fisheries and Oceans Canada / Pêches et Océans Canada

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Email: conrad.mullins@dfo-mpo.gc.ca

Abbott, Melissa H

From: Janes, Jennifer
Sent: Thursday, September 17, 2009 2:58 PM
To: Abbott, Melissa H
Subject: Sentence for SEA s.19(1)

With Annette's help here are a few sentences.
Hopefully it's what you were looking for.
Jennifer

In 2007, Science based conservation objectives were identified for the entire LOMA and 11 site specific EBSAs in a Science Advisory Report (Fisheries and Oceans Canada , 2007). Since then Oceans Division has undertaken a risk analysis of the conservation priorities identified in this document to help the LOMA Committee in directing management efforts for the components/ properties of the ecosystem most at risk.

DFO, 2007. Placentia Bay-Grand Banks Large Ocean Management Area Conservation Objectives. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/042.

Jennifer Janes M.Sc.
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709 772 3578 (fax)

Templeman, Nadine

From: Worcester, Tana
Sent: September-17-09 6:04 PM
To: Templeman, Nadine
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11
Attachments: Skate_comments.doc

Hi Nadine. Here are a few more comments on skate that were submitted.

To date, contributors have been :

Brian Petrie
Jim Simon
Glén Herbert
Tana Worcester

Tana Worcester
Coordinator, Advisory Services
Centre for Science Advice - Maritimes Region (DFO) Bedford Institute of Oceanography
1 Challenger Drive, Dartmouth, NS.
P: (902) 426-9920
F: (902) 426-5435

-----Original Message-----

From: Templeman, Nadine
Sent: September 17, 2009 1:19 PM
To: Worcester, Tana
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Hi Tana,
Do you have a list of contributors from your review?

-----Original Message-----

From: Worcester, Tana
Sent: Tuesday, September 15, 2009 9:27 PM
To: Templeman, Nadine
Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Hi Nadine. Here are some initial comments on the NL SEA for consideration. There was a lot less relevant from the Maritimes Region than expected, hence the limited scope of comments. It may be easier to provide additional comments and review once there is a draft SSR developed (so that we know where we might be able to contribute some additional information or insight). Also, timing hasn't been great on this one...

Tana Worcester
Coordinator, Advisory Services
Centre for Science Advice - Maritimes Region (DFO) Bedford Institute of Oceanography

1 Challenger Drive, Dartmouth, NS.

P: (902) 426-9920

F: (902) 426-5435

-----Original Message-----

From: Templeman, Nadine

Sent: September 11, 2009 2:21 PM

To: Worcester, Tana

Subject: RE: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Not a problem Tana ~ I have been busy incorporating other comments that have been coming in, and actually it has been at a nice pace, so I am good.

Have a great weekend!

N.

-----Original Message-----

From: Worcester, Tana

Sent: Friday, September 11, 2009 2:46 PM

To: Templeman, Nadine

Subject: Re: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Hi Nadine. It's been a bit hectic this week, so I won't be able to send you the comments until Monday. Hope that's ok!

-----Original Message-----

From: Templeman, Nadine

To: Sutton-Pande, Vanessa; Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Gilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana

CC: Clarke, Keith

Sent: Thu Sep 10 22:41:00 2009

Subject: REMINDER- Deadline for SNL SEA Review - FRIDAY SEPT 11

Hi folks,

Just a friendly reminder that TODAY is the requested deadline for submitting your comments on the SNL SEA. I have already begun inserting comments into the draft SSRP document from those that I have received to date in hopes of getting the draft document out as early as possible next week for your review.

It would be much appreciated that if you do have comments that you feel you won't be able to get to me today, that you drop me a line to let me know that they will be outstanding so I can anticipate their arrival early next week.

Much appreciate all the efforts,
Have a wonderful weekend ~

Nadine.

From: Templeman, Nadine

Sent: Monday, August 31, 2009 9:38 AM

To: Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Gilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana
Cc: McCallum, Barry; Tillman, Joe; Clarke, Keith; Parsons, Jay; Sutton-Pande, Vanessa
Subject: CONFIRMATION - Deadline for SNL SEA Review

Good morning everybody,

I just wanted to update you on the status of the timeline for completing the review of the SNL SEA.

In sharing our concerns on the proposed shortened timeline for submission of comments, OHSAR Branch has contacted the CNLOPB and informed them that we will only be able to provide comment in the originally agreed upon timeline. This means that the deadline for submitting comments to CNLOPB will remain at September 30 and we will be following the original timeline for Science Review below :

August 21 - September 11

16 working days

Review of SEA and submission of written comments

September 11-18

5 working days

Chair to draft SSRP document and distribute to reviewers

September 21-28

5 working days

Conference call to discuss draft

Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers

September 29

1 day

Regional approval of SSRP document and feedback to Habitat

Please submit your written comments on the draft SEA to me by ****September 11**** so we can move forward as laid out in the schedule above.

Also, thank you to those who have submitted comments already.

Please contact me if you have any questions or concerns on this, or anything else regarding the review.

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Fisheries and Oceans Canada / Pêches et Océans Canada Science Branch / Direction des sciences
Environmental Sciences Division / Division Environnementale Des Sciences P. O. Box 5667 / C. P. 5667 St.
John's, NL / St. John's, Terre-Neuve A1C 5X1 Telephone / Téléphone: (709)772-3688 Facsimile / Télécopieur:
(709)772-5315 E-mail / E-mail: nadine.templeman@dfo-mpo.gc.ca <<mailto:nadine.templeman@dfo-mpo.gc.ca>>

Please note: new email format above

3.2.1.2 Finfish

Skates

Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by COSEWIC. The % occurrence is very low. Barndoor skate are currently under review by COSEWIC. The paragraph on thorny skate initially describes distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005).

Information could be updated at least to 2008. The final paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined DU, the author might consider reporting on the RV trends in each region individually.

Abbott, Melissa H

From: Lewis, Sara J
Sent: Friday, September 18, 2009 8:34 PM
To: Abbott, Melissa H
Subject: FW: DFO Science Review of SEA for Southern NL
Attachments: SNL SEA SSRP (Draft) v.6.doc

FYI

-----Original Message-----

From: Sutton-Pande, Vanessa
Sent: Fri 9/18/2009 2:11 PM
To: Sutton-Pande, Vanessa; 'eyoung@cnlopb.nl.ca'
Cc: Templeman, Nadine; Lewis, Sara J
Subject: RE: DFO Science Review of SEA for Southern NL

Hello Elizabeth,

As mentioned in my previous e-mail, a first DRAFT of the Science Special Response (SSR) from the DFO Science review of the SNL SEA is being circulated for review, prior to the conference call next week.

Due to field work and the fact that some reviewers may just be returning to the office, we might expect some last minute additions that will have to be circulated via email separate from this draft. I will ensure that you receive any additions.

Please let me know if you are planning to join the call next week. Again, if you have any questions please do not hesitate to contact myself at 772-8892 or the Chair of the review, Nadine Templeman at 772-3688.

Thank you,
Vanessa

<<SNL SEA SSRP (Draft) v.6.doc>>

From: Sutton-Pande, Vanessa
Sent: Wednesday, September 16, 2009 5:23 PM
To: 'eyoung@cnlopb.nl.ca'
Cc: Templeman, Nadine; Lewis, Sara J
Subject: DFO Science Review of SEA for Southern NL

Good day Elizabeth,

In reponse to the submission of the SEA for Southern NL to Habitat DFO Branch, Habitat have requested that DFO Science NL Region and Maritimes Region review this document. A response will be given to Habitat Branch through a Science Special Reponse Process (SSRP). A Canadian Science Advisory Secretariat (CSAS) report will be produced and posted to the CSAS website under the Science Special Response Process (SSRP) series. Please feel free to visit the CSAS

website for further information on the process and CSAS reports, http://www.dfo-mpo.gc.ca/csas/Csas/Home-Accueil_e.htm.

The Science Branch review of the SEA that is being completed will focus on the identification of data gaps, inaccuracies, and inconsistencies within this document. Nadine Templeman is Chairing this process. Once comments have been received by the Chair a draft Science Response report will be developed and circulated to all reviewers involved in this process. A conference call has been scheduled for Tuesday, September 22nd, 9:30am-12:30pm (NL Time) to discuss this draft document. The draft document will be circulated on Friday, September 18th.

We would like to invite you or someone from your organization to join this conference call. This would give you the opportunity to provide points of clarification of the science contained within the current document if required. If you would like to join the call please let me know and I can provide you with the teleconference information. If you have any questions please feel free to call myself (772-8892) or Nadine Templeman (772-3688). Thank you.

cheers,

Vanessa

Vanessa Sutton-Pande

A/ Coordinator, Centre for Science Advice (CSA) Fisheries and Oceans Canada Newfoundland & Labrador Region
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REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 16, 2009. Given that DFO is not the final advisory body for this request (through the CEAA process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within the study area, including: many species of fish, fish habitat (including benthic habitat);

commercial fisheries, marine mammals and sea turtles, species at risk and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and response

General:

It was noted throughout the review that this draft SEA demonstrates some similar gaps in knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded by the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of greater timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are NAFO sub-divisions, not Divisions, and locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the like are not common-place to most. It is suggested that a map displaying all place names that are referenced within the document should be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes

to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

SST at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not “clearly show” the Labrador Current, but at most “suggests” its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), ADCP results (Contact Dave Senciall, DFO) or calculated geostrophic currents from CTD data would be useful to relaying the appropriate information.

Also when available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, is there any explanation for the negative correlation between the summer NAO index and the storm occurrence on the CHC Response Zone?

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. However, this may not be particularly relevant to the study area.

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a CHS survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this

figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – see surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006).

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, “Fig. 2.18” in the text should read “2.28”.

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only with the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, it is not clear from the SEA why so much effort was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

It is unclear why zooplankton and phytoplankton are considered fish habitat throughout the SEA, reasoning that should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Plankton (3.1.3)

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters long the

southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf; and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate due to the fact the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

Finally, it was noted, that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

Benthic invertebrates (3.1.4)

While the references for benthic invertebrates are dated in the SEA, it is also recognized that limited recent information may be available.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the omission of this area for consideration within the overall context of the SEA, there is no mention

of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Regarding the adjacent Scotian Shelf area, it would be useful to include a map showing the location of the Stone Fence (along with the representation of other coral areas).

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in other instances as well.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO SAR which is cited states, "CPUE changed little during 2004-2006 before **decreasing** in 2007". However, the most recent DFO SAR (2009/045) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008b) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '*...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...*', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site

specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 **week** pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area.

Finfish (3.2.1.2)

Redfish- In the third paragraph, "...and (3) *Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]...*" Should read "...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]..." Also, "*The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.*", is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the 3LNO portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "*Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank.*" However, the majority of catch of yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by COSEWIC, and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least

2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined DU, the SEA might consider reporting on the RV trends in each region individually.

Pollock- More recent information on pollock from the Maritimes Region is available in DFO (2009) and Stone et al. (2009).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is **not** in the SEA area, but no references to the Subarea 2 + Div. 3KLMNO stock (assessed by NAFO) where Div. 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St.Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, "*it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$.*" does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPs4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "*These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...*", however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantc/witch-plie-eng.htm)

Haddock- The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished

commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom, spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sandlance- For clarity and conciseness, suggested rewording of the section on sandlance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sandlance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sandlance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sandlance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers and 82 salmon populations occur within the two SFAs with fourteen scheduled rivers occurring within the SEA area." Also, "There has not been a recent individual assessment of the stocks...in the SEA area, however, stock status is estimated from a series of index rivers."

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interceptory fishery on

south coast stocks of this species; and iii) COESWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next ten years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...*They include deepwater redfish, thorny skate....*", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...*Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...*", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In addition, the 3NO cod stock is **permanently** closed to directed fishing, not for '*several months*' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American eel – Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut- It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 3O within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e, 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also

does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American plaice- Landings values in Figure 3.45 differ from values in the text. Could the figure be describing American plaice harvest in Div. 3O only while the text is describing something else? These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used.

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook trout- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American plaice- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote “a” after NL, but the footnote is not included.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Div. 3Ps in the SEA, there is no information on plaice in Div. 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing LOMA boundaries should be included in the SEA. In addition, LOMAs are **thousands** of square kilometers in size, not *hundreds* as stated in the SEA.

EBSAs (3.8.2)

It is more appropriate for this section to be titled EBSAs, AOIs, and MPAs and include greater detail on the processes and implications of establishing MPAs and MPA Networks. Also, **Six** new MPAs are to be established under the HOTO initiative, not *nine* as stated in the SEA.

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

CPAWS Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cutting under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al 2005; Mathieu et al 2005), and another major review has recently been carried out in this area

by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anarobosis (e.g. from hydrogen sulfide), or for instance altered sediment texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g. primary productivity), fish quality and fish health. However as noted in the SEA, some attention should also be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g. gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al, 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al 2007)

Production Phase (4.2)

The SEA states, “All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast.” Therefore, ship traffic

from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Interactions and Potential Effects of Routine Activities (4.5)

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

Effects of Presence of Structures (4.5.6)

Regarding the artificial-reef-effect and related scientific evidence, it would be necessary to conduct multi-year monitoring to demonstrate potential effects, the most important component of such monitoring being pre-data. That is, a Before-After-Control-Impact Design would be required, where data would be collected (probably for 3 years) before any construction takes place, followed by additional data collection after construction is completed. Furthermore, control sites should accompany this monitoring in areas that will not be affected. This study design is currently being conducted in relation to wharf and breakwater constructions in Newfoundland to assist in the determination of EAs and HADD implications.

To take advantage of science-based input, there should be discussions surrounding planned activities, and monitoring, long before (i.e. 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to the SEA process rather than the EA process if the general impacts can be identified early on.

Effects of Marine Vessel Presence (4.5.9)

The SEA states, "There is no interaction between presence of marine vessels and the Fish VEC." This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries. The SEA is very limited in addressing each of these coastal interactions.

Accidental Hydrocarbon Releases (4.6)

Interactions and Potential Effects of Accidental Hydrocarbon Releases (4.6.4)

Lobster- Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and molting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

Cumulative Effects (5.0):

Commercial, Research and Recreational Fisheries and Aquaculture (5.2)

“Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production”. This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Conclusions (6.0):

Planning Implications (6.2)

Identified Potentially Sensitive Areas (6.2.1)

Sensitive areas identified in the SEA do not include DFO *Oceans Act* Marine Protected Areas (MPAs) or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, EC, and Parks) and should therefore be considered independent of DFO's identification of EBSAs.

Addressing Data Gaps (6.4)

The SEA refers to monitoring that is specific to EAs. Where possible, it should be acknowledged that mitigation measures can be improved by early monitoring that takes place before the EA process. The SEA process may identify and enable early planning initiatives to improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the “artificial-reef” idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 3O). Throughout the review it is not clear as to what is being updated and what is new.

Conclusions

This section gives the opportunity to highlight the key conclusions and recommendations with the necessary explanations and rationales. As an example, for reviews of Environmental Impact studies, this section would include an overview of the Science comments.

The Conclusions' section must also be used to highlight the uncertainties related to the recommendations/views that are formulated and the need to conduct further analysis/peer review in the future. This point is particularly important when an *ad hoc* process was conducted because the deadline to provide the answer was too short for proceeding with the necessary preparatory work and peer review.

- Given that the current SEA area includes, and is an extension of, previous SEA areas that have been addressed in recent years, many of the comments provided by DFO Science at earlier dates have been considered and addressed in this latest assessment. However, some similar gaps in knowledge and analysis as those preceding it do still exist.
- The CNLOPB effectively acknowledges the diversity of issues surrounding potential petroleum exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.
- Major impacts may have been adequately assessed; however, there are areas of the SEA that lacked sufficient detail to qualify other risks that might require addressing at the EA stage, through a combination of identified data gaps and omissions.
- A significant shortcoming in the CNLOPB's assessment is the failure to address some vital coastal areas, especially Placentia Bay, that have been scientifically proven to provide important fish habitat, and that could be at increased risk of impact should the production stage include transshipment and storage of product at nearby shore-based facilities.
- Given natural variations in the state of the ocean, analyzing multi-year data sets in order to obtain some indication of the level of inter-annual variability in the area is often more appropriate than using shorter (e.g. 2006/2007) benchmarks for assessing potential impacts, unless there is specific rationale for doing so. Many of the key physical and biological components contained in the SEA do have significant amounts of data available that should be incorporated into describing, or at least considering, trends in the assessment.

Authors, Editors and Contributors

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Approved by

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A/Regional Director, Science
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Date: September 28, 2009

Sources of information (*Optional*)

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Templeman, Nadine

From: Anderson, M. Robin
Sent: September-21-09 2:55 PM
To: Templeman, Nadine
Cc: Clarke, Keith
Subject: RE: SNL SEA Responses??
Attachments: Review of the SCBasins SEA - anderson.doc s.19(1)

Hi Nadine,
At last, I have finished my review. [REDACTED]
Here it is. If you have any questions or would like clarification on any parts please let me know.
Robin

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From: Templeman, Nadine
Sent: September 16, 2009 7:01 PM
To: Anderson, M. Robin; Gilkinson, Kent; Mabrouk, Gehan
Cc: Clarke, Keith
Subject: SNL SEA Responses??

Hi folks,

Just wondering if you got a chance to complete your reviews of the SNL SEA? It would be much appreciated that if you have no comments to provide that you could please advise as such since the draft response for distribution, review and subsequent conference call on Tuesday needs to be completed by noon on Friday and I would like the opportunity to communicate any possible omissions/expected submissions at that time.

Thanks in advance,
Nadine.

Review of the Draft “Southern Newfoundland Strategic Environmental Assessment”

September 21st, 2009

M. Robin Anderson

As requested, I have reviewed the Draft “Southern Newfoundland Strategic Environmental Assessment” (SNL SEA) and have the following comments:

General comments and concerns

Strategic environmental assessments are designed to provide a timely evaluation of potential environmental issues and concerns that may arise with development in a particular area. As such they form a basis for environmental assessment planning and they focus the need for additional research where information gaps are identified. They may also provide much of the background environmental information that will be used for environmental assessment purposes. Thus a SEA report must be held to the same standards of documentation and quality as the subsequent environmental assessments. I found many of the biological and ecological components of the draft SNL SEA severely lacking in scientific rigor and documentation. References are either lacking or improperly cited (e.g. citing references “as cited in” other reviews). Conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced. Figure and table legends lack sufficient detail for interpretation. Some sections demonstrate a lack of understanding of the ecology of the system and while individual interactions between possible projects or activities and VECs are discussed each is viewed independently and there is no attempt at integration. This is particularly evident in the discussion (and dismissal) of potential cumulative effects.

A number of geographic place names referred to in the document are not indicated on the accompanying maps making it difficult to follow the information presented.

Specific comments

Tables in Section 2 There are no units for the numbers in these tables.

Section 2.1 A discussion of storm surges should be included in this section.

P52 bullet 1 What is the location of the Eastern and Western Valleys? A map of the place names used in this section and/or latitudes and longitudes should be included here.

P58 ¶3 Coral reefs are also fish habitat.

P59 ¶4 Laminarial communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan

Membranipora membranacea. The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and response. This should be considered in the SNL SEA.

Section 3.1.2.2 Benthic diatoms are commonly associated with intertidal sands and muds not deep water communities. The community structure and composition of pelagic ecosystems in south coast estuaries is not properly documented here.

Section 3.1.3 This section shows a very poor understanding of planktonic communities and their ecology. The section on phytoplankton is an oversimplification that omits relevant details of community composition, succession and dynamics.

Station 27 is not located in or near the SEA area. If plankton dynamics are to be inferred from this station for the project area then the report must include a demonstration that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

References are lacking for this section.

P60 last ¶ The comment on diurnal migration refers to which groups of zooplankton?

Section 3.1.4 This is a reference list only there is no synthesis or discussion.

P72 Stock status update is not provided for cod or redfish.

P81 Reference should be made to the aboriginal fishery for Atlantic Salmon.

P82 Offshore spawning of capelin should be discussed in this section. (It is included in table 3.2.)

P214 There is not a lot of data for eels in NL Region but there is some. The data for eels that we do have does show trends over time and was used in the SARA assessment.

P241 The release of drilling wastes to the bottom should be included here.

P248 ¶3 Where are the references for the duration of measurable concentrations of drilling waste on the bottom?

P248 ¶5 Why are the many wells of white Rose used as a worst case scenario for the purposes of this discussion? It would be more appropriate to use the

predictions developed for the individual EA s for exploratory wells on or near the Grand Banks.

P273 ¶1 Disposal of drill cuttings and mud has the potential to cause a HADD. This needs to be discussed in this section.

P273 ¶3 The potential for taint of commercial fish should be discussed here.

Section 4.5.3.1 Rock placement is not always an acceptable habitat compensation in the Region.

The justification for creating habitat in a potentially contaminated area (near a drilling rig) needs to be discussed.

The reef effect and the attraction of fish to a potentially contaminated site needs to be discussed.

The effects of the fisheries exclusion zone need to be discussed.

P275 The risks associated with the discharge of produced water are not solely related to hydrocarbons. The effects of nutrients, heavy metal and radioisotopes also need to be discussed.

Section 5.0 Cumulative effects Specific effects of a single activity (e.g. drilling wastes) may be additive but the effects of several different components of a single activity or multiple activities may be synergistic. For example, Sublethal hydrocarbon toxicity, nutrient loading and fishing pressure may affect fish trophodynamics and foodweb structure.

Where is the evidence that effects added by exploration and production activities will be negligible and not measurable?

P298 Maps of existing and planned subsea cables should be included.

If you have any questions about these comments and recommendations or would like more detail please let me know.

Robin Anderson

Abbott, Melissa H

From: Kuehnemund, Sigrid
Sent: Tuesday, September 22, 2009 11:03 AM
To: Abbott, Melissa H
Subject: RE: Emailing: Draft2comments SEA (2).doc
Attachments: Draft2comments SEA SK track changes.doc

Please see my track changes. Please let me know if you have any questions.

Thanks,

Sigrid

-----Original Message-----

From: Abbott, Melissa H
Sent: Tuesday, September 22, 2009 9:30 AM
To: Kuehnemund, Sigrid
Subject: Emailing: Draft2comments SEA (2).doc

The message is ready to be sent with the following file or link attachments:

Draft2comments SEA (2).doc

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

Comments Notes from DFO Oceans – Newfoundland Region

Page 1

- In the Scoping Document, Section 7.2.2, the coastline/shoreline environment is included in the detailed listing of information that will be captured within the SEA.
- In this draft report, the introduction states that the following specific issues are relevant for the Southern Newfoundland SEA, including the first bullet states, “...Effects of oil and gas activities on the marine ecosystem from the low water mark to the offshore (4000 m depth)”.
- The effects of oil and gas activities are felt in the marine, coastal, and estuarine environments and should be fully captured and included in a SEA.

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Page 55

- Section 2.7.2– From a planning perspective, ~~There~~ is no mention of the planning implications of the ocean currents entering the Gulf of St. Lawrence (see Section 2.2.1.1). Ocean currents in the Gulf of St. Lawrence flow in a counter-clockwise direction and winds blow onshore (predominantly northwest to southerly winds) along the southwest and west coast for much of the year. Taking into account the enclosed nature of the Gulf of St. Lawrence and the cyclonic flow of ocean currents and predominant onshore winds, there is a high probability that an accidental oil spill originating in the SEA area would reach coastal areas of western Newfoundland and perhaps throughout the Gulf of St. Lawrence. In addition, while ice cover may not be an issue in the SEA area itself, pack-ice in the Gulf would complicate efforts of oil spill remediation.

Page 211

- Section 3.7.1.3– The document makes mention of the fact that the Laurentian North population of Atlantic cod includes St. Pierre Bank and Northern Gulf of St. Lawrence cod. However, it fails to describe the important migration of cod (as well as other demersal species) that takes place between these two areas. Cod in the Northern Gulf of St. Lawrence and along the south coast of Newfoundland comprise an assemblage of stocks within which there is considerable mixing. They are currently at low levels as a group and overall have declined by about 80% over the past thirty years.

- Sec 3.8.1 - Please replace the 1st paragraph with the following, "*The SEA Area includes a large area in the Placentia Bay Grand Banks (PBGB) LOMA, overlaps and is adjacent to a portion of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative Area, and as well, borders the Gulf of St. Lawrence Integrated Management (GOSLIM) Area at the most southerly point within the Cabot Strait. These Integrated Management bodies and processes are important from a planning perspective.*" (slight change to wording)

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Sec 3.8.1.3 (General information on GOSLIM)

- The Southern Newfoundland SEA borders the GOSLIM LOMA boundary at the most southerly point within the Cabot Strait (NAFO 4R boundary), which encompasses the West Coast of Newfoundland EBSA (10) and the Bay St. George/Port au Port Peninsula Coastal Management Area.

Two major concerns from a GOSLIM perspective would involve the impacts on migratory marine species that utilize the area of the proposed SEA; and interaction between oil and gas operations and the physical elements of the marine area within the Cabot Strait.

From a physical perspective, the Labrador Current generally moves westward along the south coast of the Island of Newfoundland and then northward into the Gulf of St. Lawrence. Winds are predominantly westerly, blowing onshore from the west/southwest during the summer months and west/northwest for much of the winter. Ice cover along the southern most portion of the West Coast is minimal (<60 days) (*AMEC Earth and Environmental Limited, 2001. Biophysical Overview of Western Newfoundland and Southern Labrador*).

- **CMA:** It is suggested that this section include information on the Bay St. George/Port au Port Peninsula Coastal Management Area, as follows: *Could include this information under heading of CMA, as it is done under PBGB. "The Bay St. George/Port au Port Peninsula Coastal Management Area encompasses St. George's Bay, an important spring and fall spawning/feeding area for Atlantic herring and migration/staging area for Atlantic salmon. The lobster fishery is also a significant economic driver for communities in the area. The Grand Codroy Estuary is an important staging/nesting area for migrating waterfowl and shorebirds including the endangered Piping plover."*

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- Sec 3.8.2 General information on GOSLIM EBSAs: ~~Atlantic cod,~~ redfish and other marine species use the Esquiman Channel including the Cabot Strait escarpment as a principal migration corridor. Dense concentrations of Atlantic cod are known to overwinter in NAFO Area 3PN (within the Southern Newfoundland SEA), migrating along the Equiman Channel and northern GSL in the spring to spawn and returning in the fall (~~-----~~DFO, 2006. Ecologically and Biologically Significant Areas (EBSA) in the Estuary and Gulf of St. Lawrence: identification and characterization. DFO Can. Sci. Advis. Sec., Sci. Adv.Rep. 2007/016).

Given the compounding effect of ocean currents, winds and lack of ice cover; there is increased potential for a spill to impact on coastal and marine habitat and species along Western Newfoundland. In this regard, ~~There are probably some data gaps concerning to fill regarding the~~ impacts of various stages of operation on migratory species should be addressed.

- In Section 3.8.2, it is stated that there will be 9 new MPA's created. It should be clarified that ~~---(needs to be clarified) that the nine new marine~~ protected areas consist of six Oceans Act MPAs and the other three are Parks Canada and Environment Canada initiatives.

- (Next Sentence) DFO NL Region has identified 11 EBSA's within the Placentia Bay Grand Banks Large Ocean Management Area. These areas will be important for further conservation planning and as potential ~~AOIs-----~~as areas, when given further consideration, that may need some additional level of protection, either through an Oceans Act Marine Protected Area, a National Marine Conservation Area (Parks Canada), a Marine Wildlife Area (Environment Canada) or a Fisheries Act closure.

Page 225

- Section 3.8.2 (Page 225) -- There is mention of the West Coast of Newfoundland EBSA immediately adjacent to the SEA area and a reference given (DFO 2007f). It should be noted that while not yet been published on the DFO CSAS website, further documentation does exist further describing conservation priorities within the West Coast of Newfoundland EBSA. The manuscript document may be obtained by contacting Gerald Chaput, DFO Moncton (506) 851-2022 or Gerald.Chaput@dfo-mpo.gc.ca ~~---(does not yet appear on the CSAS website)~~

Page 233

- Section 3.8.7 (Page 233) – The potential implications of the presence of Ecologically and Biologically Significant ~~ensitive~~ Areas within and adjacent to the SEA area should ~~seems inadequate, needs to be discussed~~ within this section elaborated. ~~Proponents need to be aware that there are areas that have been identified as~~ Ecologically and Biologically Significant Areas have been identified by DFO Science for Large Ocean Management Area planning initiatives. ~~as well as that there have been Large Ocean Management Areas.~~ These identifications do not necessarily mean restrictive conservation or management measures, but proponents should be aware that scientific and planning work is ongoing and EBSAs will be an important tool for further conservation planning (i.e., potential use for identifying future marine protected areas for MPA network planning, and developing integrated management objectives to support sustainable oceans management planning). ~~Decision makers responsible for ocean activities,~~ will be able to plan and manage human activities in a comprehensive manner, while considering all measures necessary for the conservation, protection and sustainable use of ocean resources and the shared use of ocean areas.

Appendix I (Page A-1)

Issues and Concerns

5th paragraph under Fisheries and Oceans

- It indicates the area has been identified as being ecologically important for one or more various reasons (possible reasons listed in CSAS Research Document 2007/052 – Placentia Bay-Grand Banks Large Ocean Management Area Ecologically and Biologically Significant Areas).

7th paragraph

- ...and the application of ecological (remove technical) and feasibility.....

8th paragraph

- "DFO will work with..." should be changed to ".....DFO Oceans will work with Fisheries and Aquaculture Management, Science, the Province, and stakeholders to identify....."
- The objective of a MPA is to conserve and protect the *important aspects* of marine ecosystems (remove ecological integrity).

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- The pPersonal communication attributed to Geoff Coughlan; July 2009...This was in fact a collaboration from DFO Oceans and should not be attributed to him directly.

CommentsNotes from DFO Oceans – Maritimes Region

Figure X. Study areas created from the mapping of ecological priority areas on the Scotian Shelf. In 2009, a subset of these areas will undergo public consultation to choose one Area of Interest (AOI) to become a Marine Protected Area under the *Oceans Act*. While only one of these areas will become an AOI in the short term, the mapping of ecological priority areas will serve as the foundation for a marine protected area network in the region. This work builds on the work to identify EBSAs in the region, but uses a more data-driven approach. The sites are referred to as: 1) Sydney Bight, 2) St Anns Bank, 3) North of Canso Bank, 4) Misaine Bank and Eastern Shoal, 5) Middle Bank, 6) the Gully Trough, 7) Shortland and Haldimand Canyons and Slope, and 8) the Northern Spur.

The three study areas adjacent to and/or partially within the Southern Newfoundland SEA area are St. Anns Bank, Misaine Bank and Eastern Shoal, and Shortland and Haldimand Canyons and Slope.

Misaine Bank & Eastern Shoal

Misaine Bank is unique compared to other banks on the Scotian Shelf because its surface was carved into deep channels by glaciers more than 10,000 years ago. This study area includes parts of Artimon Bank, the Laurentian Channel, and the Eastern Shoal on Banquereau. These features provide important habitat for many different fishes and other animals, including redfish, snow crab, skates, sculpins, and shrimp. Fragile and long-lived deep sea corals and sponges have also been found in several parts of the area. The area is important habitat to several at-risk or depleted species, including winter skate, Atlantic cod, and two species of wolffish. Many species of fish and whales migrate through this area, especially along the shelf edge into the Laurentian Channel, where they feed on krill and other prey.

St Anns Bank

This area includes St Anns Bank, Seatarie Bank, and a portion of the Laurentian Channel. Many species migrate through the St Anns Bank study area including fishes like herring and bluefin tuna and the endangered blue whale, along with other whales, porpoises, and dolphins. Endangered leatherback turtles feed in this area during the late summer and early fall. Atlantic cod from the Gulf of St Lawrence, which are currently at very low numbers, use parts of this area in the winter when shallower Gulf waters are too cold. The area is also important habitat for Atlantic wolffish – another at-risk species. Finally, corals and sponges can be found in the deeper parts of the area.

Shortland and Haldimand Canyons and Slope

This area of the Scotian Shelf Slope features Shortland Canyon and Haldimand Canyon, both of which are known to be important habitat for the endangered Northern bottlenose whale and support significant concentrations of large branching cold-water corals. This slope area consistently shows a high biodiversity relative to other parts of the Scotian Shelf, and provides important habitat to a number of species including halibut, thorny skate, and redfish. Finally, the Stone Fence, one of the most important areas to corals in the region, is found in this area, at the “corner” where the Laurentian Channel turns into the shelf slope. The only records of living *Lophelia pertusa*, a reef-forming deep-water coral, in the Maritimes are from this area. This prompted the creation of the Lophelia Coral Conservation Area in 2004, which restricts all bottom fisheries for the protection of corals.

Also included:

- Map of Study Areas (attached)



StudyAreas8_numbered.jpg (795 ...)

- Updated figure showing general coral locations, the figure should be credited as follows: Benthic Ecology Group, BIO, DFO (attached)



ScotianShelfMap_Corals_Map2_Au...

Templeman, Nadine

From: Jack Lawson [REDACTED]
Sent: September-22-09 9:46 PM
To: Stenson, Garry; Templeman, Nadine; Sutton-Pande, Vanessa
Subject: Lawson edits and additions of the SNL SEA review document for Science
Attachments: SNL SEA SSRP (Draft) v.6 Lawson Suggestions in Track Changes; ATT248505.htm

Hello,

the subject line says it all - here are my edits and suggestions. A fairly thorough SEA-level review, although it is missing some relatively new data that has been available for several years on leatherback turtle and marine mammal survey information.

s.19(1)



Fisheries and Oceans
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Newfoundland and Labrador

Canadian Science Advisory Secretariat
Science Response 2009/nnn

REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 16, 2009. Given that DFO is not the final advisory body for this request (through the CEAA process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project-specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within the study area, including: many species of fish, fish habitat (including benthic habitat);

September 2009

Canada

commercial fisheries, marine mammals, and sea turtles, some of which are species at risk, and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and ~~response~~Response

General:

It was noted throughout the review that this draft SEA demonstrates some similar gaps in knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded by the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g., spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of greater broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are NAFO sub-divisions, not Divisions, and locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the like are not common-place to most. It is suggested that a map displaying all place names that are referenced within the document should be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes

to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

SST at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not “clearly show” the Labrador Current, but at most “suggests” its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), ADCP results (Contact Dave Senciall, DFO) or calculated geostrophic currents from CTD data would be useful to relaying the appropriate information.

Also when available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, is there any explanation for the negative correlation between the summer NAO index and the storm occurrence on the CHC Response Zone?

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. However, this may not be particularly relevant to the study area.

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a CHS survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this

figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – see surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006).

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, “Fig. 2.18” in the text should read “2.28”.

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only with the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, it is not clear from the SEA why so much effort was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

It is unclear why zooplankton and phytoplankton are considered fish habitat throughout the SEA, reasoning that should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Plankton (3.1.3)

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters along the

southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf, and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate ~~due to~~^{since} the fact the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

Finally, it was noted, that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

Benthic invertebrates (3.1.4)

While the references for benthic invertebrates are dated in the SEA, it is also recognized that limited recent information may be available.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the

omission of this area for consideration within the overall context of the SEA, there is no mention of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Regarding the adjacent Scotian Shelf area, it would be useful to include a map showing the location of the Stone Fence (along with the representation of other coral areas).

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in other instances as well.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO SAR which is cited states, "CPUE changed little during 2004-2006 before **decreasing** in 2007". However, the most recent DFO SAR (2009/045) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008b) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 week pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area.

Finfish (3.2.1.2)

Redfish- In the third paragraph, "...and (3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]..." Should read "...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]..." Also, "*The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.*" is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the 3LNO portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "*Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank.*" However, the majority of catch of yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by COSEWIC, and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a

small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined DU, the SEA might consider reporting on the RV trends in each region individually.

Pollock- More recent information on pollock from the Maritimes Region is available in DFO (2009) and Stone et al. (2009).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is **not** in the SEA area, but no references to the Subarea 2 + Div. 3KLMNO stock (assessed by NAFO) where Div. 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, "it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$." does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPS4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...", however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantic/witch-plie-eng.htm)

Haddock- The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom, spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sand lance- For clarity and conciseness, suggested rewording of the section on sand lance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand lance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers *and 82 salmon populations* occur within the two SFAs with fourteen *scheduled rivers* occurring within the SEA area." Also, "There has not been a recent *individual* assessment of the stocks...in the SEA area, *however, stock status is estimated from a series of index rivers.*"

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely

domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interceptory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behaviour of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviours for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next ten years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...They include deepwater redfish, thorny skate...", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In addition, the 3NO cod stock is **permanently** closed to directed fishing, not for 'several months' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American eel-Eel – Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut- It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 3O within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e., 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American plaice~~Plaice~~- Landings values in Figure 3.45 differ from values in the text. Could the figure be describing American plaice harvest in Div. 30 only while the text is describing something else? These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used.

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook trout~~Trout~~- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Marine Mammals (3.5)

The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940s based on whaling station records.

While the DFO database was sighted, the caveats associated with these data (listed much later in the descriptive section, must emphasized when statements such as 'Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed

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cetacean species within the SEA Area (251 sightings of 3249 individuals). While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as DFO must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years. The 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution patterns are mainly a function of effort rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast. See:

Lawson, J.W. and Gosselin, J.-F. 2009. Distribution and preliminary abundance estimates for cetaceans seen during Canada's marine megafauna survey: a component of the 2007 INASS. Department of Fisheries and Oceans, Ottawa, ON. DFO Canadian Science Advisory Secretariat Research Document 2009/031. iv + 29 p.

There have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasional sightings by DFO and others. Thus the statement "Bottlenose whales were observed exclusively in offshore areas." is not true.

Sei whales have been seen close to shore in the SEA study area. Two sei whales were seen in Placentia Bay in July.

I would not agree with the statement that "Blue whales were frequently observed in the SEA Area." They have been sighted here, but rarely.

Until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area "...presumably represent components of the Scotian Shelf population."

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Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American plaice~~Plaice~~- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote "a" after NL, but the footnote is not included.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Div. 3Ps in the SEA, there is no information on plaice in Div. 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

The large-scale aerial survey conducted in the late summer of 2007 (Lawson and Gosselin, 2009) provided data which allowed a minimal estimate of leatherback turtle abundance. For the south coast of Newfoundland survey stratum only, it was estimated that there were at least 700 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the consistent long-term use of this area in the summer and early fall by feeding turtles, and the seasonal abundance of primary turtle prey (euryfish), is suggestive that the Newfoundland south coast might be considered critical habitat. Consideration of critical habitat will occur this week (Sept. 25, 2009) during a conference call with the federal leatherback turtle working group to update the Leatherback Action Plan to include critical habitat designations.

The text on page 221 does not include the leatherback sightings made during the 2007 aerial survey and more recent data from other sources, but the overall pattern of most leatherbacks being on the south coast of Newfoundland will remain the same.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing LOMA boundaries should be included in the SEA. In addition, LOMAs are **thousands** of square ~~kilometers~~kilometres in size, not *hundreds* as stated in the SEA.

EBSAs (3.8.2)

It is more appropriate for this section to be titled EBSAs, AOIs, and MPAs and include greater detail on the processes and implications of establishing MPAs and MPA Networks. Also, **Six** new MPAs are to be established under the HOTO initiative, not *nine* as stated in the SEA.

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

CPAWS Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area.

As mentioned previously, the south coast of Newfoundland – particularly in the St. Pierre Bank area – is under consideration as critical habitat for leatherback sea turtles as a feeding area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cutting under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al. 2005; Mathieu et al. 2005), and another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anarobosis (e.g., from hydrogen sulfide), or for instance altered sediment texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g., primary productivity), fish quality and fish health. However as noted in the SEA, some attention should also be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g., gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al., 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al. 2007; Andrews et al. 2007)

In Table 4.4 it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

Production Phase (4.2)

The SEA states, "All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast." Therefore, ship traffic from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Interactions and Potential Effects of Routine Activities (4.5)

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Page 267 mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long term effects of exposure to deleterious levels of sound from these blasts.

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Page 270 - there is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect must be removed.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

Effects of Presence of Structures (4.5.6)

Regarding the artificial-reef-effect and related scientific evidence, it would be necessary to conduct multi-year monitoring to demonstrate potential effects, the most important component of such monitoring being pre-data. That is, a Before-After-Control-Impact Design would be required, where data would be collected (probably for 3 years) before any construction takes place, followed by additional data collection after construction is completed. Furthermore, control sites should accompany this monitoring in areas that will not be affected. This study design is currently being conducted in relation to wharf and breakwater constructions in Newfoundland to assist in the determination of EAs and HADD implications.

To take advantage of science-based input, there should be discussions surrounding planned activities, and monitoring, long before (i.e., 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to the SEA process rather than the EA process if the general impacts can be identified early on.

Effects of Marine Vessel Presence (4.5.9)

The SEA states, "There is no interaction between presence of marine vessels and the Fish VEC." This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries. The SEA is very limited in addressing each of these potentially important coastal interactions.

Accidental Hydrocarbon Releases (4.6)

Interactions and Potential Effects of Accidental Hydrocarbon Releases (4.6.4)

American Lobster- Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and moulting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

There is little data to investigate the possibility that the prey of leatherbacks might become contaminated. Given that leatherback turtles are known to consume anthropogenic debris, it is possible they might eat hydrocarbon products such as tar mats or tar balls, in addition to oiled jellyfish.

Cumulative Effects (5.0):

Commercial, Research and Recreational Fisheries and Aquaculture (5.2)

"Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production". This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Conclusions (6.0):

Planning Implications (6.2)

Identified Potentially Sensitive Areas (6.2.1)

Sensitive areas identified in the SEA do not include DFO *Oceans Act* Marine Protected Areas (MPAs) or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, EC, and Parks) and should therefore be considered independent of DFO's identification of EBSAs.

Addressing Data Gaps (6.4)

The SEA refers to monitoring that is specific to EAs. Where possible, it should be acknowledged that mitigation measures can be improved by early monitoring that takes place before the EA process. The SEA process may identify and enable early planning initiatives to improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the "artificial-reef" idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 3O). Throughout the review it is not clear as to what is being updated and what is new.

Conclusions

This section gives the opportunity to highlight the key conclusions and recommendations with the necessary explanations and rationales. As an example, for reviews of Environmental Impact studies, this section would include an overview of the Science comments.

The Conclusions section must also be used to highlight the uncertainties related to the recommendations/views that are formulated and the need to conduct further analysis/peer review in the future. This point is particularly important when an *ad hoc* process was conducted

because the deadline to provide the answer was too short for proceeding with the necessary preparatory work and peer review.

- Given that the current SEA area includes, and is an extension of, previous SEA areas that have been addressed in recent years, many of the comments provided by DFO Science at earlier dates have been considered and addressed in this latest assessment. However, some similar gaps in knowledge and analysis ~~as present in reports those preceding it~~ do still exist.
- The CNLOPB effectively acknowledges the diversity of issues surrounding potential petroleum exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.
- Major impacts may have been adequately assessed; however, there are areas of the SEA that lacked sufficient detail to qualify other risks that might require addressing at the EA stage, through a combination of identified data gaps and omissions.
- A significant shortcoming in the CNLOPB's assessment is the failure to address some vital coastal areas, especially Placentia Bay, that have been ~~scientifically~~ proven to provide important fish habitat, and that could be at increased risk of impact should the production stage include transshipment and storage of product at nearby shore-based facilities.
- Given natural variations in the state of the ocean, analyzing multi-year data sets in order to obtain some indication of the level of inter-annual variability in the area is often more appropriate than using shorter (e.g., 2006/2007) benchmarks for assessing potential impacts, unless there is specific rationale for doing so. Many of the key physical and biological components contained in the SEA do have significant amounts of data available that should be incorporated into describing, or at least considering, trends in the assessment.

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Newfoundland and Labrador**Science Response: Review of the SNL SEA**

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Date: September 28, 2009

Sources of information (Optional)

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Can. Sci. Advis. Sec. Sci. Resp. 2009/nnn.

best regards, Jack



"If swimming is so good for one's figure, how do we explain whales?"

s.19(1)

Templeman, Nadine

From: Dwyer, Karen
Sent: September-23-09 2:52 PM
To: Templeman, Nadine
Subject: RE: Conference Call Review - SNL SEA Science Special Response Draft

Hi Nadine

I was just looking over the Response document and I noticed a couple of things (I just glanced at it):

- 1.p. 16 - Leatherback Turtle paragraph is right in the middle of American plaice section.
2. Brian Healy in the Auditors, Editors and Contributors Section should be Brian Healey
3. Did Dawn Maddock Parsons review? I didn't notice her name. Nor John Bratney. Just making sure.

From: Templeman, Nadine
Sent: Wednesday, September 23, 2009 2:48 PM
To: Dwyer, Karen
Subject: RE: Conference Call Review - SNL SEA Science Special Response Draft

Thanks Karen! N.

From: Dwyer, Karen
Sent: Wednesday, September 23, 2009 2:47 PM
To: Templeman, Nadine
Subject: Accepted: Conference Call Review - SNL SEA Science Special Response Draft
When: Thursday, September 24, 2009 1:30 PM-4:30 PM (GMT-03:30) Newfoundland.
Where: EPS Boardroom

s.19(1)

Hi Nadine

I SHOULD be there, [REDACTED]

Karen

Templeman, Nadine

From: Stenson, Garry
Sent: September-23-09 11:58 AM
To: Jack Lawson; Templeman, Nadine; Sutton-Pande, Vanessa
Subject: RE: Lawson edits and additions of the SNL SEA review document for Science
Attachments: SNL SEA SSRP (Draft) v.6 Lawson Suggestions in Track Changes gbs.doc

Here are some additional comments on seals

Garry

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s.19(1)

From: Jack Lawson [mailto:]
Sent: September 22, 2009 9:46 PM
To: Stenson, Garry; Templeman, Nadine; Sutton-Pande, Vanessa
Subject: Lawson edits and additions of the SNL SEA review document for Science

Hello,

the subject line says it all - here are my edits and suggestions. A fairly thorough SEA-level review, although it is missing some relatively new data that has been available for several years on leatherback turtle and marine mammal survey information.



Fisheries and Oceans
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Science

Sciences

Newfoundland and Labrador

Canadian Science Advisory Secretariat
Science Response 2009/nnn

REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 16, 2009. Given that DFO is not the final advisory body for this request (through the CEAA process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project-specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within the study area, including: many species of fish, fish habitat (including benthic habitat);

September 2009

Canada

commercial fisheries, marine mammals, and sea turtles, some of which are species at risk, and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and ~~response~~Response

General:

It was noted throughout the review that this draft SEA demonstrates some similar gaps in knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded by the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g., spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of greater broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are NAFO sub-divisions, not Divisions, and locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the like are not common-place to most. It is suggested that a map displaying all place names that are referenced within the document should be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes

to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

SST at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not “clearly show” the Labrador Current, but at most “suggests” its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), ADCP results (Contact Dave Senciall, DFO) or calculated geostrophic currents from CTD data would be useful to relaying the appropriate information.

Also when available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, is there any explanation for the negative correlation between the summer NAO index and the storm occurrence on the CHC Response Zone?

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. However, this may not be particularly relevant to the study area.

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a CHS survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this

figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – see surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006).

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, “Fig. 2.18” in the text should read “2.28”.

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only with the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, it is not clear from the SEA why so much effort was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

It is unclear why zooplankton and phytoplankton are considered fish habitat throughout the SEA, reasoning that should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Plankton (3.1.3)

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters along the

southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf, and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate ~~due to~~since ~~the fact~~ the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

Finally, it was noted, that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

Benthic invertebrates (3.1.4)

While the references for benthic invertebrates are dated in the SEA, it is also recognized that limited recent information may be available.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the

omission of this area for consideration within the overall context of the SEA, there is no mention of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Regarding the adjacent Scotian Shelf area, it would be useful to include a map showing the location of the Stone Fence (along with the representation of other coral areas).

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in other instances as well.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO SAR which is cited states, "CPUE changed little during 2004-2006 before **decreasing** in 2007". However, the most recent DFO SAR (2009/045) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008b) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 week pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area.

Finfish (3.2.1.2)

Redfish- In the third paragraph, "...and (3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]..." Should read "...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]..." Also, "*The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.*" is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the 3LNO portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "*Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank.*" However, the majority of catch of yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by COSEWIC, and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a

small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined DU, the SEA might consider reporting on the RV trends in each region individually.

Pollock- More recent information on pollock from the Maritimes Region is available in DFO (2009) and Stone et al. (2009).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is **not** in the SEA area, but no references to the Subarea 2 + Div. 3KLMNO stock (assessed by NAFO) where Div. 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, "it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$," does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPS4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...", however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantic/witch-plie-eng.htm)

Haddock- The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom, spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sand lance~~Sand Lance~~- For clarity and conciseness, suggested rewording of the section on sand lance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand lance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers *and 82 salmon populations* occur within the two SFAs with fourteen *scheduled rivers* occurring within the SEA area." Also, "There has not been a recent *individual* assessment of the stocks...in the SEA area, *however, stock status is estimated from a series of index rivers.*"

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely

domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interceptory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behaviour of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviours for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next ten years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...They include deepwater redfish, thorny skate....", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In addition, the 3NO cod stock is **permanently** closed to directed fishing, not for 'several months' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American eel - Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut - It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 3O within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e., 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American plaice~~Plaice~~- Landings values in Figure 3.45 differ from values in the text. Could the figure be describing American plaice harvest in Div. 30 only while the text is describing something else? These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used.

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook trout~~Trout~~- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Marine Mammals (3.5)

The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was sighted, the caveats associated with these data (listed much later in the descriptive section) must emphasized when statements such as "Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed

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cetacean species within the SEA Area (251 sightings of 3249 individuals)". While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as DFO must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years; the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution "patterns" are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast. See:

Johnson, M. and O'Brien, J. F. 2009. Distribution and preliminary abundance estimates for cetaceans in the Strait of St. Lawrence and the Gulf of St. Lawrence. DFO Atlantic Region Research Document, 2009-071. vi + 29 p.

There have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement "Bottlenose whales were observed exclusively in offshore areas..." is not true.

Sei whales have been seen close to shore in the SEA study area: two sei whales were seen in Placentia Bay in July.

I would not agree with the statement that "Blue whales were frequently observed in the SEA Area." They have been sighted here, but rarely.

Until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area "...presumably represent components of the Scotian Shelf population."

The SEA study area is an important transit area for large whales moving through the area, and many sightings have been reported in the area. The SEA study area is an important transit area for large whales moving through the area, and many sightings have been reported in the area.

There is a need to address the issue of the SEA study area.

The SEA study area is an important transit area for large whales moving through the area, and many sightings have been reported in the area. The SEA study area is an important transit area for large whales moving through the area, and many sightings have been reported in the area.

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Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American plaice- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote "a" after NL, but the footnote is not included.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Div. 3Ps in the SEA, there is no information on plaice in Div. 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

The large-scale aerial survey conducted in the late summer of 2007 (Lawson and Gosselin, 2009) provided datae which allowed a minimal estimate of leatherback turtle abundance. For the south coast of Newfoundland survey stratum only, it was estimated that there were at least 700 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the consistent long-term use of this area in the summer and early fall by feeding turtles, and the seasonal abundance of primary turtle prey (jellyfish), is suggestive that the Newfoundland south coast might be considered critical habitat. Consideration of critical habitat will occur this week (Sept. 25, 2009) during a conference call with the federal leatherback turtle working group to update the Leatherback Action Plan to include critical habitat designations.

The text on page 221 does not include the leatherback sightings made during the 2007 aerial survey, and more recent data from other sources, but the overall pattern of most leatherbacks being on the south coast of Newfoundland will remain the same.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing LOMA boundaries should be included in the SEA. In addition, LOMAs are **thousands** of square ~~kilometers~~kilometres in size, not *hundreds* as stated in the SEA.

EBSAs (3.8.2)

It is more appropriate for this section to be titled EBSAs, AOIs, and MPAs and include greater detail on the processes and implications of establishing MPAs and MPA Networks. Also, Six new MPAs are to be established under the HOTO initiative, not *nine* as stated in the SEA.

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

CPAWS Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area.

As mentioned previously, the south coast of Newfoundland – particularly in the St. Pierre Bank area – is under consideration as critical habitat for leatherback sea turtles as a feeding area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cutting under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al. 2005; Mathieu et al. 2005), and another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anararobosis (e.g., from hydrogen sulfide), or for instance altered sediment texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance

have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g., primary productivity), fish quality and fish health. However as noted in the SEA, some attention should also be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g., gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al., 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al., 2007; Andrews et al., 2007)

In Table 4.4, it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

Production Phase (4.2)

The SEA states, "All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast." Therefore, ship traffic from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Interactions and Potential Effects of Routine Activities (4.5)

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic

invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Page 267 mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long-term effects of exposure to deleterious levels of sound from these blasts.

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Page 270 – there is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect must be removed.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

Effects of Presence of Structures (4.5.6)

Regarding the artificial-reef-effect and related scientific evidence, it would be necessary to conduct multi-year monitoring to demonstrate potential effects, the most important component of such monitoring being pre-data. That is, a Before-After-Control-Impact Design would be required, where data would be collected (probably for 3 years) before any construction takes place, followed by additional data collection after construction is completed. Furthermore, control sites should accompany this monitoring in areas that will not be affected. This study design is currently being conducted in relation to wharf and breakwater constructions in Newfoundland to assist in the determination of EAs and HADD implications.

To take advantage of science-based input, there should be discussions surrounding planned activities, and monitoring, long before (i.e., 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to the SEA process rather than the EA process if the general impacts can be identified early on.

Effects of Marine Vessel Presence (4.5.9)

The SEA states, "There is no interaction between presence of marine vessels and the Fish VEC." This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries. The SEA is very limited in addressing each of these potentially important coastal interactions.

Accidental Hydrocarbon Releases (4.6)

Interactions and Potential Effects of Accidental Hydrocarbon Releases (4.6.4)

American Lobster- Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and moulting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

There is little data to investigate the possibility that the prey of leatherbacks might become contaminated. Given that leatherback turtles are known to consume anthropogenic debris, it is possible they might eat hydrocarbon products such as tar mats or tar balls, in addition to oiled jellyfish.

Cumulative Effects (5.0):

Commercial, Research and Recreational Fisheries and Aquaculture (5.2)

"Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production". This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Conclusions (6.0):

Planning Implications (6.2)

Identified Potentially Sensitive Areas (6.2.1)

Sensitive areas identified in the SEA do not include DFO *Oceans Act* Marine Protected Areas (MPAs) or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, EC, and Parks) and should therefore be considered independent of DFO's identification of EBSAs.

Addressing Data Gaps (6.4)

The SEA refers to monitoring that is specific to EAs. Where possible, it should be acknowledged that mitigation measures can be improved by early monitoring that takes place before the EA process. The SEA process may identify and enable early planning initiatives to improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the "artificial-reef" idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 3O). Throughout the review it is not clear as to what is being updated and what is new.

Conclusions

This section gives the opportunity to highlight the key conclusions and recommendations with the necessary explanations and rationales. As an example, for reviews of Environmental Impact studies, this section would include an overview of the Science comments.

The Conclusions' section must also be used to highlight the uncertainties related to the recommendations/views that are formulated and the need to conduct further analysis/peer review in the future. This point is particularly important when an *ad hoc* process was conducted because the deadline to provide the answer was too short for proceeding with the necessary preparatory work and peer review.

- Given that the current SEA area includes, and is an extension of, previous SEA areas that have been addressed in recent years, many of the comments provided by DFO Science at earlier dates have been considered and addressed in this latest assessment. However, some similar gaps in knowledge and analysis ~~as present in reports these preceding it this~~ do still exist.
- The CNLOPB effectively acknowledges the diversity of issues surrounding potential petroleum exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.
- Major impacts may have been adequately assessed; however, there are areas of the SEA that lacked sufficient detail to qualify other risks that might require addressing at the EA stage, through a combination of identified data gaps and omissions.
- A significant shortcoming in the CNLOPB's assessment is the failure to address some vital coastal areas, especially Placentia Bay, that have been ~~scientifically~~ proven to provide important fish habitat, and that could be at increased risk of impact should the production stage include transshipment and storage of product at nearby shore-based facilities.
- Given natural variations in the state of the ocean, analyzing multi-year data sets in order to obtain some indication of the level of inter-annual variability in the area is often more appropriate than using shorter (e.g., 2006/2007) benchmarks for assessing potential impacts, unless there is specific rationale for doing so. Many of the key physical and biological components contained in the SEA do have significant amounts of data available that should be incorporated into describing, or at least considering, trends in the assessment.

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Date: September 28, 2009

Sources of information *(Optional)*

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Can. Sci. Advis. Sec. Sci. Resp. 2009/nnn.

Templeman, Nadine

From: Han, Guoqi
Sent: September-23-09 8:42 AM
To: Templeman, Nadine
Subject: RE: SNL SEA Review- Oceanographic references

Hi Nadine,

"Han 2003" should be "Han 2004".

See below for full references:

- Ayan H. Chaudhuri, Avijit Gangopadhyay, James J. Bisagni, 2009. **Interannual variability of Gulf Stream warm-core rings in response to the North Atlantic Oscillation**, *Continental Shelf Research*, 29 (7), 856-869.
- Han G., Z. Lu, Z. Wang, J. Helbig, N. Chen and B. deYoung, 2008: **Seasonal variability of the Labrador Current and shelf circulation off Newfoundland**. *J. of Geophysical Res.*, 113, C10013, doi: 10.1029/2007JC004376.
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From: Templeman, Nadine
Sent: Monday, September 14, 2009 2:06 PM
To: Han, Guoqi
Subject: SNL SEA Review- Oceanographic references

Hi Guoqi,
Would you be able to provide me the full citations for the references below when you get the chance?
Thanks very much,
Nadine.

e.g. Han 2003 J Geophysical Research; Han 2004 Marine Geodesy; Chaudhuri et al., 2009, Continental Shelf Research; Han et al., 2008, JGR

From: Han, Guoqi
Sent: Thursday, September 10, 2009 1:57 PM
To: Templeman, Nadine
Subject: RE: CONFIRMATION - Deadline for SNL SEA Review

Hi Nadine,

Below are my comments.

2.1.2-2.1.6

IS there any indication of trends in the intensities of wind, wave, air temperature, sea surface temperature, visibility, and precipitation in the past 50 years?

Table 2.2 to 2.11: Add units.

SST at the first occurrence in the text or table/figure captions should be spelled out.

2.1.7 Are there any local observational data for calibration of the algorithm?

2.1.8 Indicate where the CHC Response Zone is. Is there any explanation for the negative correlation between the summer NAO index and the storm occurrence on the CHC response Zone?

2.2.1

Overall the summary is weak about the ocean current variability, without including the advances made in the past decade.

Page 31: There are studies on ocean currents associated with Gulf Stream rings (e.g. Han 2003 J Geophysical Research; Han 2004 Marine Geodesy; Chaudhuri et al., 2009, Continental Shelf Research) for the Slope Sea. The speed can reach 1-2 m/s in Region 3. Surface current statistics for this region from satellite altimetry are also described in various publications (e.g. Han 2004 Marine Geodesy; 2006 Advances in Space Research).

Table 2.17, Provide unit for the speed.

Figure 2.26. The temperature pattern does not “clearly show” the Labrador Current, but at most “suggests” its existence. If the authors do want to show the two branches of the Labrador Current, they can use some model results (Han et al., 2008, JGR), ADCP results (Contact Dave Senciall, DFO) or calculate the geostrophic currents from the CTD data.

2.3.2 Sea Ice

Page 43. The zonal division line in Fig. 2.28 is at about 56.1W not 55W. Which one is right?
Fig. “2.18” in the text should read “2.28”?

2.7.2

The conclusion needs to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with significantly large current speed (1-2 m/s) may reach quite deep (>1000m). Could this be something significantly different for the slope region when compared with operations over the Grand Bank, in terms of possible flow-induced torque? Current meter data should be collected over the deep slope.

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From: Templeman, Nadine
Sent: Monday, August 31, 2009 9:38 AM
To: Sjare, Becky; Healey, Brian; Nakashima, Brian; Stirling, Charles; Bourgeois, Chuck; Morris, Corey; Parsons, Dawn; Power, Don; Stansbury, Don; Dawe, Earl; Murphy, Eugene; Mowbray, Fran; Stenson, Garry; Mabrouk, Gehan; Han, Guoqi; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Wheeler, John; Dwyer, Karen; Gilkinson, Kent; Simpson, Mark R; Ollerhead, Neil; Pepin, Pierre; Collins, Roanne; Anderson, M. Robin; Worcester, Tana
Cc: McCallum, Barry; Tillman, Joe; Clarke, Keith; Parsons, Jay; Sutton-Pande, Vanessa
Subject: CONFIRMATION - Deadline for SNL SEA Review

Good morning everybody,

I just wanted to update you on the status of the timeline for completing the review of the SNL SEA.

In sharing our concerns on the proposed shortenend timeline for submission of comments, OHSAR Branch has contacted the CNLOPB and informed them that we will only be able to provide comment in the originally agreed upon timeline. This means that the deadline for submitting comments to CNLOPB will remain at Septemeber 30 and we will be following the original timeline for Science Review below :

August 21 - September 11	16 working days	Review of SEA and submission of written comments
September 11-18	5 working days	Chair to draft SSRP document and distribute to reviewers
September 21-28	5 working days	Conference call to discuss draft Chair to finalize SSRP document and circulate (via e-mail) for final approval by reviewers
September 29	1 day	Regional approval of SSRP document and feedback to Habitat

Please submit your written comments on the draft SEA to me by **September 11 so we can move forward as laid out in the schedule above.**

Also, thank you to those who have submitted comments already.

Please contact me if you have any questions or concerns on this, or anything else regarding the review.

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Fisheries and Oceans Canada / Pêches et Océans Canada

Science Branch / Direction des sciences

Environmental Sciences Division / Division Environnementale Des Sciences

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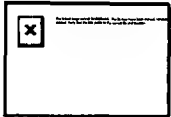
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Please note: new email format above



Templeman, Nadine

From: Lewis, Sara J
Sent: September-24-09 4:10 PM
To: Templeman, Nadine
Subject: FW: SN SEA

Nadine,

Here are Oceans comments if you wish to see how they approached their section as promised.
Sara

From: Abbott, Melissa H
Sent: Tuesday, September 22, 2009 1:48 PM
To: Lewis, Sara J
Subject: SN SEA

s.19(1)

Hi Sara

I will be back in office on Thursday if you would like to discuss



SN SEA

comments for S...

Melissa Abbott
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**Pages 338 to / à 343
are duplicates of
sont des duplicatas des
pages 276 to / à 281**

Templeman, Nadine

From: Worcester, Tana
Sent: September-25-09 4:50 PM
To: Templeman, Nadine
Subject: NL SEA

Hi Nadine. Here's some suggestions for the SEA. I've put them into track changes into the document sent around for the meeting, recognizing of course that it's been modified since then, but hopefully you can make use of whatever you want. I still haven't heard from Steve - [REDACTED] but I'll let you know on Monday.



SNL SEA SSRP
(Draft)_tw.doc

s.19(1)

Tana Worcester
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Canadian Science Advisory Secretariat
Science Response 2009/nnn

REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 16, 2009. Given that DFO is not the final advisory body for this request (through the [Canadian Environmental Assessment Act \(CEAA\)](#) process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects ~~which~~ that may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project-specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within

September 2009

Canada

the study area, including: many species of fish, fish habitat (including benthic habitat); commercial fisheries, marine mammals and sea turtles, species at risk and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and Response

General:

Given the intent of a SEA to form a basis for subsequent environmental assessment (EA) planning by providing much of the background environmental information that will be used for EA purposes and to focus on the needs for additional research where information gaps are identified, a SEA report must be held to the same standards of documentation and quality as the subsequent environmental assessments. However, many of the biological and ecological components of the draft SNL SEA are severely lacking in this required scientific rigor and documentation. Also in this respect, references are often lacking or improperly cited. For example, some conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced, while other references are cited using "as cited in" other reviews. With respect to the presentation of figures and tables, many of these lack sufficient detail for interpretation.

It was noted throughout the review that this draft SEA demonstrates some similar gaps in knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided for this Region does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are Northwest Atlantic Fisheries Organization (NAFO) sub-divisions, not Divisions, and locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the like are not common-place to most. It is suggested that a map displaying all place names that are referenced within the document should be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

Sea surface temperature (SST) at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not "clearly show" the Labrador Current, but at most "suggests" its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), Acoustic Doppler Current Profile (ADCP) results (Contact Dave Senciall, DFO), or calculated geostrophic currents from Conductivity Temperature Depth (CTD) data would be useful to in relaying the appropriate information.

When available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document. A discussion of storm surges should also be included in this section.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, ~~is there any an~~ explanation for the negative correlation between the summer North Atlantic Oscillation (NAO) index and the storm occurrence on the CHC Response Zone? ~~would be helpful~~

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. ~~However, this may not be particularly relevant to impacts within the study area, but it could be relevant to distribution of discharges that were to occur along the north-western boundary of the SEA area.~~

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a Canadian Hydrographic Service (CHS) survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – ~~see-sea~~ surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006).

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, "Fig. 2.18" in the text should read "2.28".

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only with the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

| ~~What is the location of the Eastern and Western Valleys?~~ ~~is not clear.~~ These should be indicated by either map or latitudes and longitudes in this section.

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, it is not clear from the SEA why so much effort was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

Coral reefs are also a fish habitat VEC and should be highlighted as such in the introduction of this section.

Zooplankton and phytoplankton are considered fish habitat throughout the SEA. It is unclear why reasoning that should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Estuarine Algae - Overall, the community structure and composition of pelagic ecosystems in south coast estuaries is not adequately documented and requires elaboration.

Laminarial communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan *Membranipora membranacea*. The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and response. This should be considered in the SNL SEA.

Also of note, benthic diatoms are commonly associated with intertidal sands and muds, not deep water communities as presented in the SEA.

Plankton (3.1.3)

This section ~~shows a very poor understanding of~~ does not adequately describe planktonic communities and their ecology – where much of the related discussion is an oversimplification that omits relevant details of community composition, succession and dynamics.

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters long the southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into

surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf; and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate since the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

It was also noted that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

More generally, since Station 27 is not located in or near the SEA area, if plankton dynamics are to be inferred from this station for the project area then the report must include a demonstration that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

Finally, the comment on diurnal migration refers to which groups of zooplankton?

Benthic invertebrates (3.1.4)

While the references for benthic invertebrates are dated in the SEA, it is also recognized that limited recent information may be available. However, this section presents a reference list only – there is no related synthesis or discussion.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the omission of this area for consideration within the overall context of the SEA, there is no mention of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Regarding the adjacent Scotian Shelf area, it would be useful to include a map showing the location of the Stone Fence (along with the representation of other coral areas).

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in other instances as well.

Eels should be addressed specifically in the SEA. Available data for eels was used in the Species at Risk Act (SARA) assessment and shows trends over time.

With respect to cod and redfish descriptions, stock status updates should be provided in the appropriate sections.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO Science Advisory Report (SAR) which is cited states, "CPUE changed little during 2004-2006 before **decreasing** in 2007". However, the most recent DFO SAR (DFO 2009/046a) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008b) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '*...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...*', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 week pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area. Additional information on sea cucumber in the Atlantic Region, including Newfoundland waters, can be found in DFO (2009e).

Finfish (3.2.1.2)

Redfish- In the third paragraph, "*....and (3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]...*" Should read "*...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]...*" Also, "*The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.*" is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the NAFO Divisions 3LNO portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank." However, the majority of catch of yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

White Hake - Major spelling error in first paragraph, Cape Hatteras, should read, Cape Hatteras. Also the statement White hake are a temperate species at the limit of their temperature range and as a result are scarcely restricted to the south western Grand Banks is confusing and inconsistent with the previous statement that they range from Cape Hatteras to Southern Labrador. Perhaps reference to the SEA area would be helpful here.

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Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by the Committee on the Status of Endangered Wildlife Species in Canada (COSEWIC), and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined Designatable Unit (DU), the SEA might consider reporting on the RV research vessel trends in each region individually.

Pollock- A more recent summary of information on pollock from the Newfoundland Region NAFO Divisions 4WX5Z is available in DFO (2009c) and Stone et al. (2009).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is not in the SEA area, but no references to the Subarea 2 + Divisions 3KLMNO stock (assessed by NAFO) where Division 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, "it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$." does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPs4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "*These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...*", however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantic/witch-plie-eng.htm)

Haddock- The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Hagfish : Additional information on hagfish, including information from Newfoundland waters can be found in DFO 20091

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Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom, spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sand Lance- For clarity and conciseness, suggested rewording of the section on sand lance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand lance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers *and 82 salmon populations* occur within the two SFAs with fourteen *scheduled rivers* occurring within the SEA area." Also, "There has not been a recent *individual* assessment of the stocks...in the SEA area, *however, stock status is estimated from a series of index rivers*."

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interceptory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next ten years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...They include deepwater redfish, thorny skate....", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In addition, the 3NO cod stock is **permanently** closed to directed fishing, not for 'several months' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes

Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American Eel – Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut- It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 3O within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e., 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American Plaice- Landings values in Figure 3.45 differ from values in the text. ~~Could it is possible that the figure be is~~ describing American plaice harvest in Div. 3O only while the text is describing something else?— These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used.

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook Trout- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Marine Mammals (3.5)

The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was cited, the caveats associated with these data (listed much later in the descriptive section) must be emphasized when statements such as "*Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed cetacean species within the SEA Area (251 sightings of 3249 individuals)*". While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as DFO must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years; the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution "patterns" are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast (see Lawson and Gosselin 2009).

There have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement "*Bottlenose whales were observed exclusively in offshore areas...*" is not true.

Sei whales have been seen close to shore in the SEA study area: two sei whales were seen in Placentia Bay in July.

I would not agree with the single statement that "Blue whales were frequently observed in the SEA Area" is not entirely accurate. They have been sighted here, but rarely.

Until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area "...presumably represent components of the Scotian Shelf population."

Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American Plaice- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote "a" after NL, but the footnote is not included.

Leatherback Turtle- The large-scale aerial survey conducted in the late summer of 2007 (Lawson and Gosselin, 2009) provided data which allowed a minimal estimate of leatherback turtle abundance. For the south coast of Newfoundland survey stratum only, it was estimated that there were at least 700 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the consistent long-term use of this area in the summer and early fall by feeding turtles, and the seasonal abundance of primary turtle prey (jellyfish), is suggestive that the Newfoundland south coast might be considered critical habitat. Consideration of critical habitat will occur this week (Sept. 25, 2009) during a conference call with the federal leatherback turtle working group to update the Leatherback Action Plan to include critical habitat designations.

The text on page 221 does not include the leatherback sightings made during the 2007 aerial survey, and more recent data from other sources, but the overall pattern of most leatherbacks being on the south coast of Newfoundland will remain the same.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Div-Subdivision 3Ps in the SEA, there is no information on plaice in Div-Division 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing Large Ocean Management Area (LOMA) boundaries should be included in the SEA. In addition, LOMAs are **thousands** of square kilometres in size, not *hundreds* as stated in the SEA.

Ecologically and Biologically Significant Areas (EBSAs) (3.8.2)

It is more appropriate for this section to be titled EBSAs, Areas of Interest (AOIs), and Marine Protected Areas (MPAs) and include greater detail on the processes and implications of establishing MPAs and MPA Networks. Also, Six new MPAs are to be established under the Heath of the Oceans (HOTO) initiative, not *nine* as stated in the SEA.

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

Canadian Parks and Wilderness Society (CPAWS) Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area.

As mentioned previously, the south coast of Newfoundland – particularly in the St. Pierre Bank area – is under consideration as critical habitat for leatherback sea turtles as a feeding area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cutting under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al 2005; Mathieu et al 2005), and another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anararobosis (e.g. from hydrogen sulfide), or for instance altered sediment texture. It is reasonable to note that any slight movement and deposition at fines whether

caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g. primary productivity), fish quality and fish health. However as noted in the SEA, some attention should also be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g. gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al 2007).

In Table 4.4, it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

Production Phase (4.2)

The SEA states, "All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast." Therefore, ship traffic from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Potential Sources of Effects from Routine Activities (4.4)

The release of drilling wastes to the bottom should be addressed in this section, and references for the duration of measurable concentrations of drilling waste on the bottom need to be included.

For the purposes of the discussion on offshore drilling the many wells of White Rose are used as a worst case scenario. It would be more appropriate to use the predictions developed for the individual EAs for exploratory wells on or near the Grand Banks in this case.

Interactions and Potential Effects of Routine Activities (4.5)

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

This discussion on sound mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long-term effects of exposure to deleterious levels of sound from these blasts.

On page 270 – there is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect must be removed.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

The disposal of drill cuttings and mud has the potential to cause a HADD, and therefore should be discussed in the section on Fish, Fish Habitat and Fisheries. The potential for taint of commercial fish should be discussed in this section.

Effects on Bottom Disturbance (4.5.3)

With respect to fish habitat, rock placement is not always an acceptable habitat compensation in the Region. Other areas requiring discussion in this section include the the justification for creating habitat in a potentially contaminated area (near a drilling rig); the reef effect and the attraction of fish to a potentially contaminated site; and the effects of the fisheries exclusion zone.

Effects of Produced Water (4.5.4)

The risks associated with the discharge of produced water are not solely related to hydrocarbons. The effects of nutrients, heavy metals and radioisotopes also need to be discussed.

Effects of Presence of Structures (4.5.6)

Regarding the artificial-reef-effect and related scientific evidence, it would be necessary to conduct multi-year monitoring to demonstrate potential effects, the most important component of such monitoring being pre-data. That is, a Before-After-Control-Impact Design would be required, where data would be collected (probably for 3 years) before any construction takes place, followed by additional data collection after construction is completed. Furthermore, control sites should accompany this monitoring in areas that will not be affected. This study design is currently being conducted in relation to wharf and breakwater constructions in Newfoundland to assist in the determination of EAs and Harmful Alteration, Disruption and Destruction (HADD) implications.

To take advantage of science-based input, there should be discussions surrounding planned activities, and monitoring, long before (i.e. 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to the SEA process rather than the EA process if the general impacts can be identified early on.

Effects of Marine Vessel Presence (4.5.9)

The SEA states, "There is no interaction between presence of marine vessels and the Fish VEC." This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries. The SEA is very limited in addressing each of these potentially important coastal interactions.

Accidental Hydrocarbon Releases (4.6)

Interactions and Potential Effects of Accidental Hydrocarbon Releases (4.6.4)

American Lobster- Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and molting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

There is little data to investigate the possibility that the prey of leatherbacks might become contaminated. Given that leatherback turtles are known to consume anthropogenic debris, it is possible they might eat hydrocarbon products such as tar mats or tar balls, in addition to oiled jellyfish.

Cumulative Effects (5.0):

Specific effects of a single activity (e.g. drilling wastes) may be additive but the effects of several different components of a single activity or multiple activities may be synergistic. For example, sublethal hydrocarbon toxicity, nutrient loading and fishing pressure may affect fish trophodynamics and foodweb structure.

Also, where is the evidence that effects added by exploration and production activities will be negligible and not measurable? Reference?

Maps of existing and planned subsea cables should be included for these discussions.

Commercial, Research and Recreational Fisheries and Aquaculture (5.2)

"Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production". This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Subsea Cables (5.7)

Maps of existing and planned subsea cables should be included in this section.

Conclusions (6.0):

Planning Implications (6.2)

Identified Potentially Sensitive Areas (6.2.1)

Sensitive areas identified in the SEA do not include DFO *Oceans Act* Marine Protected Areas (MPAs) or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, *Environment Canada*, and *Parks Canada*) and should therefore be considered independent of DFO's identification of EBSAs.

Addressing Data Gaps (6.4)

The SEA refers to monitoring that is specific to EAs. Where possible, it should be acknowledged that mitigation measures can be improved by early monitoring that takes place before the EA process. The SEA process may identify and enable early planning initiatives to

improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the "artificial-reef" idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 30). Throughout the review it is not clear as to what is being updated and what is new.

Conclusions

The review gives the opportunity to highlight the key conclusions and recommendations with the necessary explanations and rationales. As an example, for reviews of environmental impact studies, the report would discuss an overview of the stated mission.

The conclusions section must also be used to highlight the information related to the recommendations that are formulated and the need to conduct further analysis and review in the future. The point is particularly important when an SEA process was conducted because the product to provide the project was too short for proceeding with the necessary preparation work and open issues.

Given that the current SEA area includes, and is an extension of, the previous Laurentian sub-basin SEA and the Sydney Basin SEA areas that have been addressed recently by DFO in recent years, many of the comments provided by DFO Science in relation to earlier dates to those previous SEA reviews have been considered and addressed in this latest assessment. And a number of sections have been greatly enhanced with more recent information (e.g., the second section). In addition, the Southern Newfoundland SEA effectively acknowledges the extent of issues surrounding potential petroleum exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.

However, some of the current Southern Newfoundland SEA still contains some similar gaps in information in knowledge and analysis. Present information gaps that still exist. The Science Special Response has focused on these gaps in information and analysis and appropriate suggestions for improvement are provided.

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The CNLOPB effectively acknowledges the diversity of issues surrounding potential petroleum exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.

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Major impacts may have been adequately assessed; however, there are areas of the SEA that lacked sufficient detail to qualify/quantify other risks (e.g., potential impacts to vulnerable species and sensitive areas) that might require addressing additional risks at the project EA stage, through a combination of identified data gaps and omissions.

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A significant shortcoming in the CNLOPB's assessment Southern Newfoundland SEA is the failure to address some vital coastal areas, especially Placentia Bay, that have been proven to provide important fish habitat, and that could be at increased risk of impact should the

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production stage include transshipment and storage of product at nearby shore-based facilities.
(reference to agreed to scope of SEA)

Given natural variations in the state of the ocean, analyzing multi-year data sets in order to obtain some indication of the level of inter-annual variability in the area is often more appropriate than using shorter (e.g. 2006/2007) benchmarks for assessing potential impacts, unless there is specific rationale for doing so. Many of the key physical and biological components contained in the SEA do have significant amounts of data available that should be incorporated into describing, or at least considering, trends in the assessment.

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Date: September 28, 2009

Sources of information

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Templeman, Nadine

From: Sutton-Pande, Vanessa
Sent: September-25-09 4:13 PM
To: Templeman, Nadine
Subject: My draft notes & references

Hey Nadine,

s.19(1)

I have my draft notes that I will be editing again but I thought to send to you now for reference.



Vanessa's
rapporteur note...

The two species I have references that should be included in the Science response are:

Sea Cucumber:

DFO. 2009. An Assessment of the Sea Cucumber (*Cucumaria frondosa*) Resource on the St. Pierre Bank in NAFO Subdivision 3Ps. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2009/044.

NOT YET PUBLISHED: Stansbury, D.E and Hynick, E. M. In preparation. An assessment of the sea cucumber (*Cucumaria frondosa*) resource on The St. Pierre Bank in NAFO Subdivision 3Ps. DFO Can. Sci. Advis. Sec. Res. Doc. In prep.

NOT YET PUBLISHED: DFO. 2009. Proceedings of the Meeting of the Newfoundland and Labrador Regional Advisory Process (RAP) on Sea Cucumber. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2009/xxx. (in prep)

Atlantic Hagfish:

NOT YET PUBLISHED: DFO. 2009. Assessment of NAFO Division 3O and Subdivision 3Ps Atlantic hagfish (*glutinosa*). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2009/042.

NOT YET PUBLISHED: DFO. 2009. Proceedings of the Newfoundland Regional Advisory Process (RAP) on Hagfish. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2009/XXX.

Have a GREAT weekend,

V

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Rapporteur's Notes

Review of the Southern Newfoundland Strategic Environmental Assessment Science Special Response draft document review – Teleconference DRAFT version: SNL SEA SSRP (Draft) v8.doc

Thursday, September 24, 2009
1:30 pm - 4:30pm NL time

Chair: Nadine Templeman
Rapporteur: Vanessa Sutton-Pande

Agenda

[Recorded on Folder A – 02]

Started at 1:45PM (15 minutes late starting)

Chair stated that we were 15 minutes late, and you all received the draft. Some background we did invite the proponent, Elizabeth Young at CNLOPB, provided the draft SSR and could not make the call. There was some concern that because this is the first time that we have provided this information to Habitat Management this way and because we are publishing a CSAS document that the proponent should be included like other peer review meetings.

We did a roll-call.

DFO NL Roll call:

Jerry Payne, DFO Science, Environmental Sciences, NL Region
Joanne Morgan, DFO Science, Aquatic Resources, NL Region
Jack Lawson, DFO Science, Aquatic Resources, NL Region
Sara Lewis, DFO Habitat Management, NL Region
Carole Grant, DFO Habitat Management, NL Region
Brian Healey, DFO Science, Aquatic Resources, NL Region
Robin Anderson, DFO Science, Environmental Sciences, NL Region
Karen Dwyer, DFO Science, Aquatic Resources, NL Region
Vanessa Sutton-Pande, CSA Coordinator, NL Region
Eugene Murphy, DFO Science, Aquatic Resources, NL Region
Nadine Templeman (Chair), DFO Science, Environmental Sciences, NL Region
Tana Worcester, CSA Coordinator, Maritimes Region
Elizabeth Young, CNLOPB [joined the call at 2:30pm]

Tana said that additional comments were given by participants in the Maritimes and Tana will supply.

Nadine gave an overview of the process. She mentioned the delay in the process for receiving the SEA. 4-5 days were taken off the front end of the review. CNLOPB wanted a response by September 16th and it was communicated to Habitat Management that it was not acceptable deadline for a review of this document. A memo was drafted from Regional Director (RD) Science to RD Oceans, Habitat and Species at Risk (OHSAR) and stated the timelines would not be achievable from Science response perspective. Submissions started coming in early and initial draft of Science Response document was sent out last Friday (September 18th) and we originally had the call scheduled for Tuesday, September

22nd. However, due to the short review time and late submissions it was re-scheduled to today. The remainder of the process will be that we are going to send out a subsequent draft for a quick review after this call. Changes will be made with track changes.

Jerry Payne made some comments. He felt that we are not providing a time for the proponent to provide comments on the draft. He prefers the Nalcor process that was used for Lower Churchill. We should have a face to face meeting and we should go back to the Nalcor process for this review. We should have a similar process to the Georges Bank. He made the comment that the remit states a specific area and we have to be fair to that fact. He did not want to post something on-line without giving the proponent the opportunity to come back with comments. The Chair interjected and said that we were given a short deadline to have this review. Jerry felt this was not a fair process without having a face to face. The statements in the draft are general statements and some comments outside the remit of the scoping document for the proponent.

Nadine mentioned that Carole was going to respond. Jerry interjected and said that we are posting an on-line document and tying the hands of Habitat Management. Robin Anderson interjected and stated that Nadine said that the CNLOPB was invited to join the call as was similar to the Lower Churchill review and Nalcor. Jerry felt that the conference call is not enough.

Carole Grant made two points: 1) the proponent was invited to come face to face and similar to the Nalcor process, if they felt important enough then they would have provided someone to attend regardless of the advance notice; 2) Habitat Management have not been involved in this process previously, however, Habitat does have the discretion to take what Science has to say but use as they decide to do so. Jerry, states that he felt that the proponent does not have enough time to respond in this review.

Nadine went onto the next steps, which included:

- These comments to be incorporated into the next draft.
- RD Science approval.
- Response sent to Habitat.
- Habitat to draft their response to CNLOPB.
- SSRP to be posted on the CSAS website in a few weeks allowing for the translation.

Joanne Morgan said this is the same as the advice that is provided to Fisheries and Aquaculture Management (FAM). Science gives their advice publically through a Science Advisory Report (SAR) and FAM decides whether to follow or not.

Nadine said that we will bring Jerry's concerns up the line.

Tana said that the Maritimes uses the SSRP process a fair bit with SNLB. Only concern is that we do not publish anything of a confidential nature into the draft. This case is not a concern because we have a publically available document (i.e. SEA for Southern NL). In the Maritimes, most times the proponent does respond to the Science comments and how they will address the comments. Habitat then determines if that is sufficient. Sometimes we produce an initial draft and then a second draft that is posted. Several times they have held back on publishing the SSRP document until the comments have been incorporated and can say that these comments have been incorporated into the document.

Jerry said that this the SEA is very general and those EEM programs are somewhat different then this process. Jerry says that the proponent is given a remit and he felt that we are having comments outside of the scope of the remit. Tana said that the Maritimes Region have used the CSAS SSRP for EA documents and others. Nadine said that we have to move forward with the review at this point.

Chair said that we can approach this in several ways. People are pressed for time. We can deal with entire document or start with the conclusions. Jerry mentioned that we could go around the table and ask for general statements.

Robin had a question about the conclusions. Wondering where some of them came from and would like to look at those first. Nadine mentioned that she drafted the conclusions and merely put them there for discussion during the conclusions section. Included these conclusions as she felt reading the document these could be general points and wanted to use them as a starting point.

Jerry was asked if he would like to make some general statements? He agrees with the general statements but feels this is too broad (e.g. ecology and general effects). Agreed with the Maritimes comments on what was done good. Generally for a SEA thought the overview was pretty good. Thought the xxxx was covered very well. There are things such as potential oceanographic planning that would come out in specific EIS (Maritimes stated this as well). Weak on the produced water side, could have been more information used here because there is a lot of literature. Jerry gets caught up with the word 'negliable' and does not like the use of this word. Uncertainties cannot be called negliable. Some detail is a little bit over-board (i.e. halibut down to specific depths); by-catch and directed fisheries. Nadine mentioned that we do point out errors in the document. In terms of risk was well done overall. [additional comments to be added]

Jack made some comments in the text on the marine mammals along with Gary Stenson. Leatherbacks are located on south coast and they will eat anything (i.e. tar balls, etc.) and these concerns are included in the draft.

Tana asked about the COSEWIC (6-month review draft) asked about the loggerhead turtle concerns. She mentioned the COSEWIC draft report that is being tabled but not currently available to the proponent. Is it worthwhile to point out the reference in that document? Jack mentioned that within the SEA area there would not be a significant information of loggerhead turtles but this could come out in subsequent EA documents. He thought that we could not table a draft that is not publically available.

Robin said that we should mention that there is a COSEWIC RPA process currently underway for loggerhead seaturtle that are not currently available but for consideration for a future EA in the area. This can be mentioned so for the next go around the proponent knows that there will be information available.

Nadine asked for more general comments from around the table.

Robin had a general comment on the quality of the document and citations found in it. Very often the SEA document is referenced as the basic information for an area. If the information in the SEA is not correctly referenced then you come to a screeching halt during the scientific review. We have to go to a chain of documents before getting to the original statement that is being cited. If the SEA is not referenced properly then that causes an issue later in the process. This is a dangerous thing to do in a scientific document.

Joanne mentioned that there are out of date references that have been used and some are incorrect citations. Should be a summation comment made in the Science Response draft.

Nadine said this was mentioned in the general comments section and we can re-visit that and add Robin's comments.

Chair asked if people wanted to reword the first paragraph under 'analysis and response' (general). Chair read out the first sentences and asked if this was too strong of a statement. Jerry thought it was too strong. Nadine noted that this was noted by several reviewers and asked Jerry for suggestions. Jack says that we have to differentiate between 'omissions' (this is more appropriate) and 'data gaps' (the information does not exist so it sounds like we are asking proponent to fill in the data gaps). These are not the same. Group decided that 'omissions' is more appropriate in this case. Jerry was OK with the omissions issue but made the point that data gaps are important in terms of risk analysis but data gaps are endless and we have to qualify if we mention data gaps as a critique in our response.

Robin thought the SEA did a good job in identifying data gaps but did not do a good job of existing overviews of data and processes that we are looking at. We could qualify that reviewers found gaps in the data. Jerry says we have to say data gaps in relation to oceanography, etc. Nadine said we won't put that in the general statements and within the text people stated what the data gaps were that they referred to in the text. Were there any other major concerns?

Joanne Morgan referred to the third paragraph in the same section, and thought that if this is correct statement we should make this a conclusion. Nadine said that we could make this a conclusion statement. Do we want to repeat as a conclusion? Group thought yes so Nadine was going to go ahead and repeat it there.

Jerry thought that the general comments should be made clear that these are individual comments by individual reviewers. However, Tana made the point that if this is the SSRP we are putting this forward as a Science response, not individual opinions, and that the RD will approve.

Robin stated that the paragraph starting 'notable in the description' (page 2) be made a general conclusions.

Jerry mentioned that the 'areas adjacent' to the SEA area should be qualified. We have to consider the remit that was considered by the proponent. Criticism on bringing the adjacent areas into the SEA should be qualified and to be fair to the proponent.

Elizabeth Young joined in the the call at this point.

Jerry voiced concern that the proponent should be given an opportunity to have a face to face before the Science Response document is posted on-line. Thought the process was a little unfair. People thought that the proponent was given an opportunity to be involved in this process and now proponent is joining in after the call started and he thinks that like the Nalcor (Lower Churchill Review) process we should have the opportunity to sit face to face. Jerry said the point was that they do not have the opportunity to respond. Robin, as acting Division Manager of Environmental Sciences will take responsibility for choosing this review process. This type of review was decided on by the then acting Division Manager of Environmental Sciences, Robin (Section Head Ecological Sciences) and Vanessa (CSA Coordinator). Your comments and opinions on how this process can be improved will be heard and discussed but we have to get on with the review of the current document.

Nadine addressed the fact that Elizabeth joined the call later we can provide her with the information that she missed before we go on. Nadine said that we discussed the lay-out and that not too much information was missed. Some of the reviewers had to leave. Another round table was done.

We started with specific sections of the report @ 2:30pm:

Physical Environment (Climatology 2.1)

Robin asked if we had her comments on storm surges and Chair said that we did and they were included on page three.

Tana said that we may want to consider the role of EC and Climatolgy. Did we want to compare notes with EC on climatology that they may have provided. Jerry said that EC is provided with the document for review as well and provide their own comments. Sara Lewis said that EC has already submitted comments. Sara will provide the comments from DND and EC to circulate to Tana Worcester.

Physical oceanography should be 'just' not 'jus' in the first sentence. Nadine said she picked this up.

Jerry mentioned, again, for the section Currents (2.2.1) proponent was remitted to look at a specific area and these comments talking about the adjacent area. Is the 'slope area' considered within the study area of the SEA? This is the reference on page 4. Nadine said that she did check into these references and they are actually within the SEA area and relevant (e.g. Gulf Stream in 3P).

Robin made a comment on inter-annual or inter-monthly variability of the offshore branch of the Labrador current. This should be reflected in the conclusion section and Nadine made a note that it is captured in the correct place (current 2.2.1) we can see in the final draft.

Ice comments were specific to the text, a couple of grammatical errors and some of the figures do not match.

Within the bathymetry section, there were several places in the document where the geographic region is not referenced properly. In the Maritimes Region there were references to places in the document without reference, for example, listing the coral areas then should also reference in a map so if didn't know where it is then in would be difficult. Robin said that we need some referenced lat and longs in the document in relation to the common names.

Eugene mentioned that common to some industries are not going to be common to all three (i.e., Stone Fence may be reference to differently by different groups). Karen suggested maybe they could have a map with the common features up front in the document. Nadine said that this is referenced in the main part of the document.

Planning Implications (2.7) Physical Oceanography (2.7.2)

The second paragraph says that there is not enough information (page 5) but here we are giving some criticism that there is too much information. Tana stated that implications of how the data collected could be used. That they are not making the potential implaications of that information for the proponent is not being made here. Examples of how this amount of information could be used, for example, the

seismic activities and temperatures differences. [go over this again]. Nadine will add some wording to this.

Biological Environment (3.1)

Nadine made the point that the zooplankton and phytoplankton are considered fish habitat. Jerry was quite pleased that was there because he says that the water column is fish habitat. Nadine asked if water column is considered fish habitat in other assessments.

Coastal Algal Communities (3.1.2)

Robin thought be useful to have a section on AIS separately from this section for this area as these need to be thought about it terms of accumulative effects and changes to the system that it could have.

Nadine will add something here because green crab was mentioned later. Nadine stated the sentence that she was going to add...[get this statement].

Plankton (3.1.3)

A 'conclusion statement' was made out of sentences in the 3rd paragraph on page seven (i.e. It was also noted that there is no assessment.....'. [add the statement later; highlighted with blue]

Benthic invertebrates (3.1.4)

Nadine read out the first statements of this section. Jerry says that this first sentence is kind of odd, 'may be' available. This could be done for other all other sections because there 'may be' other information available for all. Nadine will spell out this in the document and thinks that the reference was to newer documents.

Tana: mentioned benthic information that collected during RV bottom trawl surveys is used in Maritimes area. Nadine asked if this information is available.

Eugene said that information is collected here in NL. Some work been done by Kent on coral species that is recent. Tana asked about non-commercial species. Eugene said that there is limited info on invertebrates available for long-term information, however, more for the recent surveys but not easily available. Nadine will re-word that section because we recognize that what is there is dated and there may be some additional recent information.

Fish (3.2)

The Chair said that she was not going to walk us through this section and asked if anyone as any issues for the fish section. Jerry again brought up the concern that that 'adjacent areas' should be put up front and qualified what we mean by this and keep in mind the remit that the proponent was working was not outside the SEA area. Concerns brought up that are not inside the SEA area.

Maritimes area refers to the SEA area and adjacent areas. Karen mentioned that in some cases it is hard to not talk about the species and stocks that are in close proximity to the SEA area. Jerry agrees but needs to be up front. Eugene said that we assess stocks based on other boundaries not the SEA boundaries. The assessments are stock specific.

Robin made the comment that we are not discussing the scoping document now, but our Science response to the SEA. Fish people can say adjacent to the SEA area (i.e. data gathering areas) and we can specify what that means for them or that there are overlap with the SEA area.

Nadine mentions to Tana that the SEA goes into the Maritimes region and hard to differentiate between Mar and NL region data. Tana said this is really in relation to the 'Fisheries catch information' is hard to differentiate between the boundary between the 2 regions. Looks like the edge of the SEA runs along the edge of the St. Lawrence channel. If we wanted to talk about activities within the SEA boundary then we can talk about the potential impacts of for example oil spills. Our intentions were to address things that happen immediately adjacent to SEA boundary. Nadine asked if she should move this down the document. Tana mentioned for the Iceland Scallop (i.e. fishery that is immediately adjacent to the SEA boundary). At the end of the day Habitat can decide whether they want to include this in their response. [review this section]

Karen Dwyer committed that the orange footed sea cucumber should be noted that there is a 2009 CSAS research document that is not referenced. ACTION: Tana agreed and will send the reference to Nadine.

Elizabeth Young asked that we provide the reference for the available information when we make comments on this in the Science response. The Chair said that we would be doing that in the document.

Within the sea cucumber document there is a reference to other more recent primary publications.

Tana asked someone from Maritimes to review the whelk section and they felt the information on whelks was correct.

Tana mentioned that the white hake section is a little inconsistent with respect to the distribution from southern Labrador and later that the northern extent is the Grand Banks. These are comments that need to be added to the Science response. Nadine asked that Tana send the statements to Nadine. ACTION: Tana will provide the statement for white hake section that mentions the two different distributions. Proponent should be more specific than the current reference and there are other 2005 references that could be mentioned. Can provide that reference.

Tana mentioned that there are the Maritimes meeting 2009 Hagfish proceedings that could be listed for the proponent. Tana will send the reference for this section.

Vanessa: send the reference for the sea cucumbers and hagfish SARs and proceedings. [not in the recording]

Tana mentioned that the dogfish section does not mention that mature females have been caught on the NL side of the Laurentian channel. The document does mention the pupping area from Steve Campana references.

Eugene mentioned that he does not know who reviewed the pollock and haddock section but not sure how pertinent the information from Stone et al. (2009) would be for NL region. Tana said she does not know how useful they are but there is information on life history characteristics.

Karen Dwyer noted that on page 11 sand lance is noted as one word and then two words. Nadine fixed this in the working document.

DFO research vessel (RV) surveys (3.2.4)

Karen stated that DFO doesn't have a lot of information in Division 30 in 2006 and we don't use this information in stock assessments. A 2 year period that is data deficient (due to vessel issues) is not good to use. Any conclusions on habitat changes should be done on more than a two year time period.

We should make the statement in the document that there is data that we ourselves are not using so it would not be appropriate for others to be using. Mention we are looking specifically at the RV surveys and DFO vessels.

Fisheries (3.3)

Karen mentioned that for Yellowtail flounder, 2006 was a bad year for DFO surveys and an unusually low year for yellowtail flounder and for by-catch for American plaice (page 14). Figure 3.30 trend for yellowtail is unusually low year. The graph for American Plaice is incorrect (fig 3.45 and 3.46). Nadine will add industry restructuring for Yellow tail and A. Plaice.

Marine Mammals (3.5)

The 'I' in the second last statement should be removed. Nadine removed this from the document.

Species at risk (3.7)

Leatherback turtle comes right in the middle of the A. Plaice discussion. Nadine fixed the ordering in the document.

Tana said that Steve Campana will give the shark section a quick look over but thought it was generally OK. Nadine will be doing the final draft tomorrow and Monday morning and asked that this review be done in that timeframe. Tana thought he might submit before the end of the call.

Potentially Sensitive Areas (3.8)

Integrated Management Areas (3.8.1)

Did we want to include some of the information from the Maritimes Science that they gave NL Oceans some information (i.e. maps, etc.). Tana said that the maps described the areas and the potential AOIs. Nadine asks if the SEA goes into the Maritimes LOMA? Tana said that it does.

Nadine said that the figure existing does not show the LOMAs. It was suggested that both NL and Maritimes Regions up to date EBSAs and AOIs maps should be used. It is mentioned that the LOMAs are thousands of meters wide but they are actually hundreds of thousands.

Nadine asked Tana if the figure 3.87 shows the Maritimes AOI? Add some text here...

Karen stated that the Table 3.22 (page 232) southeast shoal, 'some key characteristics', it is not considered a nursery habitat for American plaice any longer. Karen asked Eugene if he was knowledgeable if the southeast shoal is a haddock concentration area? **ACTION:** Karen volunteered to look into this and get us additional information or reference and we can include a statement in the SSRP document. Nadine said that about 2 years ago that CPAWS was putting this information together so if we can get newer information that would be useful.

Exploration/Production Activities and Associated Environmental Effects (4.0)

Jerry was OK with this section because we talk a little later about tainting and turbidity.

Interactions and Potential Effects of Routine Activities (4.5)

Eugene asked the group if there is anything in the production phase about fouling paints had been addressed in the document? Robin mentioned that this issue should be addressed in our response and mentions structures as well. Use and effects of anti-fouling agents should be discussed within the SEA under section 4.5 'Interactions and Potential Effects of Routine Activities'.

4.5.3

Jerry made a comment about the statement, 'With respect to fish habitat, rock placement is not always an acceptable...' we should be.....add some comments from Robin here too.

Cumulative effects (5.0)

Tana asked if we want to keep the second paragraph as a question or re-phrase as a statement. Robin made a statement that was used and Nadine inserted directly into the draft, 'References are required to substantiate the statement that effects added by exploration and production activities will be negligible and not measurable.'

Conclusions (6.0)

Elizabeth asked about the existing MPAs in the area of the SEA (what is the status) and requested any information that DFO are able to provide to the proponent. Nadine mentioned existing MPAs. Gilbery Bay and Eastport that are outside the study area and they are coastal MPAs. Before 2012 new MPAs are proposed and will be based on AOIs. Nadine will make a paragraph that upcoming AOI's should be made. Sara will send the comments that Oceans provided to Nadine for inclusion in this document to be consistent with the terminology. Tana made the comment that we should be clear about all the terminology around MPAs and AOIs. We will use the terminology that Oceans has out forward.

Conclusions Section

- We are taking some comments from the text of the draft and adding to the conclusion statements.
- Editorial comment to change 'CNLOPB' to 'this SEA document'
- Bullet with 'major impacts may have been...' Tana said that we need an example of a major impacts (e.g. tainting issue are more socio-economics in terms of closing fisheries OR the example of the leatherback turtle section and they will eat anything that resembles a jelly-fish, i.e. drilling discharges, tar balls). It was suggested to use something from the text as an example.

Tana and Jerry asked if we could say something positive about the documents because a lot of work goes into this document. In comparison to some documents there was a lot of work done and attempts to address comments made in previous documents. Robin, says that this is the position of Habitat management to take our comments that we provide and say what they want. Eugene mentioned that we are critiquing the SEA document. Nadine did say that there were comments throughout the text that says that document was positive. Tana said that it was the best seismic section that she has seen in a long time. **ACTION:** Tana was asked to draft a sentence and send it to Nadine. Nadine said that there were reviewers that were happy with the SEA work and we can acknowledge that in a statement.

Nadine commented on the next steps:

- incorporation of teleconference material to final SSRP document (Sept 29)
- Chair will send before lunch on Monday for final review
- Habitat will receive the comments on September 29th

Robin mentioned that it would be useful to let the RD of Science know that the SSRP is coming for his review and approval in advance.

Chair ended the call by thanking everyone for participating in the call and the review process.



To
A Ray Finn
RD OHSAR

From
De J. Parsons
A/ Regional Director Science
Newfoundland and Labrador Region

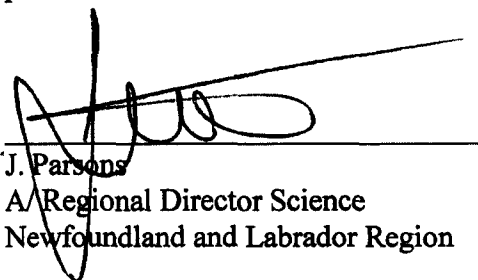
Security Classification - Classification de sécurité
Our File - Notre référence
Your File - Votre référence
Date September 28, 2009

Subject
Objet Review of the Southern Newfoundland Strategic Environmental Assessment

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). A CSAS Science Special Response Process (SSRP) was used to develop the NL Region and Maritimes Region Science response to this request. Nadine Templeman was the Chair of this process. The product of this review is the attached Science Response document entitled, "Review of the Southern Newfoundland Strategic Environmental Assessment". This document has been approved by both RD of Science in NL Region and Maritimes Region.

This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

This report will become a published CSAS Science Response Series document on the CSAS public website once the translation has been completed. If you have any questions regarding the report please contact Vanessa Sutton-Pande at 772-8892.


for J. Parsons
A/Regional Director Science
Newfoundland and Labrador Region

cc

Tom Sephton, A/RD Science, Maritimes Region
Vanessa Sutton-Pande, A/CSA Coordinator, NL Region
Tana Worcester, CSA Coordinator, Maritimes Region
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Fisheries and Oceans
Canada

Pêches et Océans
Canada

Science

Sciences

**Newfoundland and Labrador and
Maritimes Regions**

**Canadian Science Advisory Secretariat
Science Response 2009/nnn**

REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 29, 2009. Given that DFO is not the final advisory body for this request (through the Canadian Environmental Assessment Act (CEAA) process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects that may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project-specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within

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Canada

the study area, including: many species of fish, fish habitat (including benthic habitat); commercial fisheries, marine mammals and sea turtles, species at risk and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and Response

General Observations:

Given the intent of a SEA to form a basis for subsequent environmental assessment (EA) planning by providing much of the background environmental information that will be used for EA purposes and to focus on the needs for additional research where information gaps are identified, a SEA report must be held to the same standards of documentation and quality as the subsequent EAs. Often, the SEA document is referenced as the basic information for an area during an EA. Therefore, if the information in the original SEA is not correctly addressed and referenced, scientific review of subsequent documents has the potential to be cumbersome through the search for the pertinent information and/or the original statement that is being cited.

Many of the biological and ecological components of the draft SNL SEA are severely lacking in this required scientific rigor and documentation. Also in this respect, references are often lacking, are out of date, or improperly cited. For example, some conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced, while other references are cited using "as cited in" other reviews. With respect to the presentation of figures and tables, many of these lack sufficient detail for interpretation.

It was also noted throughout the review that this draft SEA demonstrates some similar omissions in the description of existing knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided for this Region does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential

impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are Northwest Atlantic Fisheries Organization (NAFO) sub-divisions, not Divisions. Additionally, it should be recognized that names common to some industries are not going to be common to all (e.g. locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the Stone Fence). It is suggested that a map displaying all place names that are referenced within the document be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

Sea surface temperature (SST) at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not “clearly show” the Labrador Current, but at most “suggests” its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), Acoustic Doppler Current Profile (ADCP) results (Contact Dave Senciall, DFO) or calculated geostrophic currents from Conductivity, Temperature, Depth (CTD) data would be useful in relaying the appropriate information.

When available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented

within this section of the document. A discussion of storm surges should also be included in this section.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, an explanation for the negative correlation between the summer North Atlantic Oscillation (NAO) index and the storm occurrence on the CHC Response Zone would be useful.

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to the Scotian Shelf, i.e., it misses the inshore Nova Scotia current. This may not be particularly relevant to impacts within the study area, but it could be relevant to distribution of discharges if they were to occur along the north-western boundary of the SEA area.

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000 m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a Canadian Hydrographic Service (CHS) survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this figure, additional labels for details such as the Laurentian Chaguel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – sea surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006) to address and highlight this interannual variability of the offshore Branch of the Labrador Current within the SEA.

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, "Fig. 2.18" in the text should read "2.28".

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only within the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

The location of the Eastern and Western Valleys is not clear. These should be indicated by either map or latitudes and longitudes in this section.

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000 m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, significant effort and detail was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that this knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information and its relationship to environmental impacts considerations could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

Coral reefs are also a fish habitat VEC and should be highlighted as such in the introduction of this section.

Zooplankton and phytoplankton are considered fish habitat throughout the SEA. It is unclear why – reasoning for this should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Estuarine Algae - Overall, the community structure and composition of pelagic ecosystems in south coast estuaries is not adequately documented and requires elaboration.

Laminarial communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan *Membranipora membranacea*. The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and response. This should be considered in the SNL SEA – possibly through the addition and incorporation of a section specifically addressing this (and other) Invasive Species.

Also of note, benthic diatoms are commonly associated with intertidal sands and muds, not deep water communities as presented in the SEA.

Plankton (3.1.3)

This section does not adequately describe planktonic communities and their ecology – where much of the related discussion is an oversimplification that omits relevant details of community composition, succession and dynamics.

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters long the southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf; and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate since the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Again, of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

It was also noted that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

More generally, since Station 27 is not located in or near the SEA area, if plankton dynamics are to be inferred from this station for the project area, then the report must include a demonstration that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

Finally, it is not clear which groups of zooplankton the comment on diurnal migration is referring.

Benthic invertebrates (3.1.4)

The references for benthic invertebrates are dated in the SEA. While this is often common in addressing this topic in the NL Region, it should also be noted that limited recent information may be available for consideration through unpublished benthic data (of non-commercial species) obtained during DFO RV surveys. With respect to the references that are included in this section, the document presents a reference list only – there is no related synthesis or discussion.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the omission of this area for consideration within the overall context of the SEA, there is no mention of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in some of these species descriptions as well.

Eels should be addressed specifically in the SEA. Available data for eels was used in the COSEWIC Assessment and Status Report (2006) and shows trends over time.

With respect to cod and redfish descriptions, stock status updates should be provided in the appropriate sections.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO SAR which is cited states, "CPUE changed little during 2004-2006 before **decreasing** in 2007". However, the most recent DFO Science Advisory Report (SAR) (DFO 2009a) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '*...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...*', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 **week** pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area. Additional information on sea cucumber in the Atlantic Region, including Newfoundland waters, can be found in DFO (2009e) and Stansbury and Hynick (2009).

Finfish (3.2.1.2)

Redfish- In the third paragraph, "...and (3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]..." Should read "...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]..." Also, "*The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.*", is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the NAFO Divisions 3LNO portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "*Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank.*" However, the majority of catch of yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

White Hake- Minor spelling error in first paragraph: "Cape Halteras" should read "Cape Hatteras." Also, the statement "White hake are a temperate species at the limit of their temperature range and as a result are spatially restricted to the south western Grand Banks" is confusing and inconsistent with the previous statement that they range from Cape Hatteras to Southern Labrador. Perhaps reference to the SEA area would be helpful here.

Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by the Committee on the Status of Endangered Wildlife Species in Canada (COSEWIC), and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined Designatable Unit (DU), the SEA might consider reporting on the research vessel trends in each region individually.

Pollock- A more recent summary of information on pollock from NAFO Divisions 4VWX5Z is available in DFO (2009c) and Stone et al. (2009).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is **not** in the SEA area, but no references to the Subarea 2 + Divisions 3KLMNO stock (assessed by NAFO) where Division 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, *"it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$."* does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPs4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, *"These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)..."*, however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlas/witch-plie-eng.htm)

Haddock- The SEA states *"...recent surveys have not shown spawning occurring in the SEA Area..."*, citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Hagfish- Additional information on hagfish, including information from Newfoundland waters, can be found in DFO (2009d).

Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on

sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom, spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sand Lance- For clarity and conciseness, suggested rewording of the section on sand lance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand lance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers and 82 salmon populations occur within the two SFAs with fourteen scheduled rivers occurring within the SEA area." Also, "There has not been a recent individual assessment of the stocks...in the SEA area, however, stock status is estimated from a series of index rivers."

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interceptory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next five years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans. This potential for error in basing conclusions on such a narrow timeframe is especially pertinent to the use of 2006/2007 RV collected in the area during those years due to incomplete survey information resulting from vessel problems there during the same timeframe. Given that this incomplete information is not used in DFO stock assessments, it would also be inappropriate for use in a SEA.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...*They include deepwater redfish, thorny skate....*", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...*Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...*", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In addition, the 3NO cod stock is **permanently** closed to directed fishing, not for '*several months*' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this

table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American Eel – Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut- It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 3O within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e, 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American Plaice- Landings values in Figure 3.45 differ from values in the text. It is possible that the figure is describing American plaice harvest in Div. 30 only while the text is describing something else. These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used. In addition, consideration of industry restructuring is also pertinent to the use of 2006 bycatch landings values for American Plaice.

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook Trout- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Marine Mammals (3.5)

The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was cited, the caveats associated with these data (listed much later in the descriptive section) must be emphasized when statements such as "*Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed cetacean species within the SEA Area (251 sightings of 3249 individuals)*". While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as DFO must be avoided or done cautiously as

annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years; the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution "patterns" are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast (see Lawson and Gosselin 2009).

With respect to specific statements on cetaceans, there have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement "*Bottlenose whales were observed exclusively in offshore areas...*" is incorrect. Also, until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area "...*presumably represent components of the Scotian Shelf population.*" Regarding Blue whales, the statement "*Blue whales were frequently observed in the SEA Area.*" is also incorrect as blue whales have been sighted here, but rarely. Finally, it should be included in the SEA that Sei whales have been seen close to shore in the SEA study area – two sei whales were observed in Placentia Bay in July.

Overall, the SEA does address seals very well. This area is an important transit area for harp and hooded seals during the winter and spring. Therefore they are seasonally abundant and not always associated with ice. Harbour seals are common in the area.

However, hooded seals have been assessed as 'Not at Risk' by COSEWIC while harps have never been assessed. This information should be corrected in Table 3.20

Additionally, the comment that grey seals are breeding on St. Pierre and Miquelon is not accurate. There have been a number of surveys that indicate few, if any, pups are born in the area. The total population of grey seals in the NW Atlantic is approximately 300,000 (not unknown – Table 3.16). This is available in a 2008 CSAS Research Document. The number present in the area is estimated from Hammill (2005) which provides estimates of abundance (that have been updated). Still, this cannot be used to estimate the total number of seals likely to be found in the area.

Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American Plaice- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote "a" after NL, but the footnote is not included.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Subdivision 3Ps in the SEA, there is no information on plaice in Division 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

Leatherback Turtle- The large-scale aerial survey conducted in the late summer of 2007 (Lawson and Gosselin, 2009) provided data which allowed a minimal estimate of leatherback turtle abundance. For the south coast of Newfoundland survey stratum only, it was estimated that there were at least 700 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the consistent long-term use of this area in the summer and early fall by feeding turtles, and the seasonal abundance of primary turtle prey (jellyfish), is suggestive that the Newfoundland south coast might be considered critical habitat. Consideration of critical habitat will occur this week (Sept. 25, 2009) during a conference call with the federal leatherback turtle working group to update the Leatherback Action Plan to include critical habitat designations.

The text on page 221 does not include the leatherback sightings made during the 2007 aerial survey, and more recent data from other sources, but the overall pattern of most leatherbacks being on the south coast of Newfoundland will remain the same.

Loggerhead Turtle- The status of loggerhead turtle is currently under assessment by COSEWIC, and DFO is expected to conduct a Recovery Potential Assessment for loggerhead in 2010. Information from these assessments should be considered in future EAs in the SEA area.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing Large Ocean Management Area (LOMA) boundaries should be included in the SEA for both NL and Maritimes Regions. In addition, LOMAs are **thousands** of square kilometres in size, not *hundreds* as stated in the SEA.

Ecologically and Biologically Significant Areas (EBSAs) (3.8.2)

It is more appropriate for this section to be titled EBSAs and Marine Protected Areas (MPAs) and include greater detail and discussion on the processes and implications of EBSAs, MPAs and MPA Networks. Also, **six** new MPAs are to be established under the Health of the Oceans (HOTO) initiative, not *nine* as stated in the SEA. Further information on the potential management implications of these initiatives can be obtained from the DFO Oceans Sector.

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

Canadian Parks and Wilderness Society (CPAWS) Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area. Also in this table, more recent information indicates that the Southeast Shoal is no longer considered nursery habitat for American Plaice and Atlantic Cod as stated in the text (K. Dwyer, pers. comm.). For American plaice there was a large shift in the location of juveniles when the stock declined from being located adjacent to the shoal to being off the shoal (see Walsh et al 2001). The amount of young cod has also been very limited over the last couple of decades. Analyses that were done showed that the spatial and temporal pattern of juvenile cod distribution was quite variable and in only 1 of the 10 years analyzed was more than 50% of the cod found on the Southeast Shoal (Walsh et al 2001). Haddock, when they were more abundant, occupied the area now occupied by yellowtail flounder here (E. Murphy, pers. comm.)

As mentioned previously, the south coast of Newfoundland – particularly in the St. Pierre Bank area – is under consideration as critical habitat for leatherback sea turtles as a feeding area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cutting under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al 2005; Mathieu et al 2005), and another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anarobiosis (e.g. from hydrogen sulfide), or for instance altered sediment

texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g. primary productivity), fish quality and fish health. However, given the large amount of available literature on this topic this section could have included more detail in the assessment. Also as noted in the SEA, some further attention should be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g. gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al 2007).

In Table 4.4, it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

Production Phase (4.2)

The SEA states, "All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast." Therefore, ship traffic from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Potential Sources of Effects from Routine Activities (4.4)

The release of drilling wastes to the bottom should be addressed in this section, and references for the duration of measurable concentrations of drilling waste on the bottom need to be included.

For the purposes of the discussion on offshore drilling the many wells of White Rose are used as a worst case scenario. It would be more appropriate to use the predictions developed for the individual EAs for exploratory wells on or near the Grand Banks in this case.

Interactions and Potential Effects of Routine Activities (4.5)

The use and effects of antifouling agents (on and offshore) should be discussed in this section.

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

This discussion on sound mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long-term effects of exposure to deleterious levels of sound from these blasts.

On page 270 – there is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect must be removed.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

The disposal of drill cuttings and mud has the potential to cause a Harmful Alteration Disruption or Destruction (HADD), and therefore should be discussed in the section on Fish, Fish Habitat and Fisheries. The potential for taint of commercial fish should be discussed in this section.

Effects on Bottom Disturbance (4.5.3)

With respect to fish habitat, rock placement is not always an acceptable habitat compensation in the Region, and comes across as implied in this section. Other areas requiring discussion in this section include the the justification for creating habitat in a potentially contaminated area (near a drilling rig); the reef effect and the attraction of fish to a potentially contaminated site; and the effects of the fisheries exclusion zone.

Effects of Produced Water (4.5.4)

The risks associated with the discharge of produced water are not solely related to hydrocarbons. The effects of nutrients, heavy metals and radioisotopes also need to be discussed.

Effects of Presence of Structures (4.5.6)

Regarding the artificial-reef-effect and related scientific evidence, it would be necessary to conduct multi-year monitoring to demonstrate potential effects, the most important component of such monitoring being pre-data. That is, a Before-After-Control-Impact Design would be required, where data would be collected (probably for 3 years) before any construction takes place, followed by additional data collection after construction is completed. Furthermore, control sites should accompany this monitoring in areas that will not be affected. This study design is currently being conducted in relation to wharf and breakwater constructions in Newfoundland to assist in the determination of EAs and HADD implications.

To take advantage of science-based input, there should be discussions surrounding planned activities, and monitoring, long before (i.e. 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to the SEA process rather than the EA process if the general impacts can be identified early on.

Effects of Marine Vessel Presence (4.5.9)

The SEA states, "There is no interaction between presence of marine vessels and the Fish VEC." This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries. The SEA is very limited in addressing each of these potentially important coastal interactions.

Accidental Hydrocarbon Releases (4.6)

Interactions and Potential Effects of Accidental Hydrocarbon Releases (4.6.4)

American Lobster- Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and molting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

There is little data to investigate the possibility that the prey of leatherbacks might become contaminated. Given that leatherback turtles are known to consume anthropogenic debris, it is possible they might eat hydrocarbon products such as tar mats or tar balls, in addition to oiled jellyfish.

Cumulative Effects (5.0):

Specific effects of a single activity (e.g. drilling wastes) may be additive but the effects of several different components of a single activity or multiple activities may be synergistic. For example, sublethal hydrocarbon toxicity, nutrient loading and fishing pressure may affect fish trophodynamics and foodweb structure.

References are required to substantiate the statement that effects added by exploration and production activities will be negligible and not measurable.

Commercial, Research and Recreational Fisheries and Aquaculture (5.2)

"Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production". This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Subsea Cables (5.7)

Maps of existing and planned subsea cables should be included in this section.

Conclusions (6.0):

Planning Implications (6.2)

Identified Potentially Sensitive Areas (6.2.1)

Sensitive areas identified in the SEA do not include DFO *Oceans Act* MPAs or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, Environment Canada, and Parks Canada) and should therefore be considered independent of DFO's identification of EBSAs.

Addressing Data Gaps (6.4)

The SEA refers to monitoring that is specific to EAs. Where possible, it should be acknowledged that mitigation measures can be improved by early monitoring that takes place before the EA process. The SEA process may identify and enable early planning initiatives to improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the "artificial-reef" idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 3O). Throughout the review it is not clear as to what is being updated and what is new.

Conclusions

- The current SEA area includes, and is an extension of, the Laurentian sub-basin SEA and the Sydney Basin SEA that have been reviewed by DFO in recent years. Many of the comments provided by DFO Science in relation for those previous SEA reviews have been considered and addressed in this latest assessment, and a number of sections have been greatly enhanced with more recent information (e.g., the seismic section). In addition, the Southern Newfoundland SEA effectively acknowledges the diversity of issues surrounding potential petroleum exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.
- However, the current Southern Newfoundland SEA still contains some similar omissions in the description of existing knowledge and analysis present in reports preceding this. This Science Special Response has focused on these omissions and additional suggestions for improvement are provided.
- A significant shortcoming in the Southern Newfoundland SEA is the failure to address some vital coastal areas, especially Placentia Bay, that have been proven to provide important fish habitat, and that could be at increased risk of impact should the production stage include transshipment and storage of product at nearby shore-based facilities, as per the agreed scope of the SEA.
- With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.
- Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible. Analyzing multi-year data sets in order to obtain some indication of the level of inter-annual variability in the area is often more appropriate than using shorter timeframes (e.g. 2006/2007) as benchmarks for assessing potential impacts, unless there is specific rationale for doing so. Many of the key physical and biological components contained in the SEA do have significant amounts of data available that should be incorporated into describing, or at least considering, trends in the assessment.
- Major impacts have been adequately assessed; however, there are sections of the SEA that lacked sufficient detail to qualify/quantify other risks (e.g., potential impacts to vulnerable species and sensitive areas) that might require additional analysis at the project EA stage
- The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of

variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program.

- Recognizing that the remit for the SEA provides a specific area for consideration, some statements in the Science review of the SEA document may include comments pertaining to areas outside of the remit by reference to adjacent areas. However, in some cases, it is difficult not to address species and stocks that are in close proximity to the SEA area as DFO assesses stocks based on other boundaries that different from the SEA boundaries, allowing for some assessment areas to overlap with the SEA area. In these instances it is the intention of the review to highlight issues pertaining to areas **immediately** adjacent to the SEA boundary.

Contributors

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Sources of information

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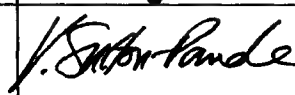
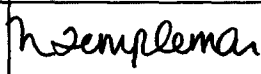

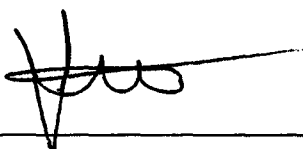


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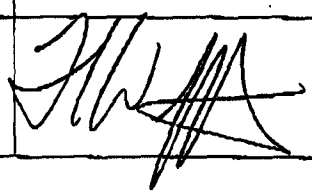
Memo to OHSAR RD

Science Response 2009/xxx, Review of the Southern Newfoundland Strategic Environmental Assessment

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Memo to OHSAR RD

Science Response 2009/xxx, Review of the Southern Newfoundland Strategic Environmental Assessment

Exploration Phase

Given available literature and EEM studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cutting under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, which would be covered in any specific environmental assessment.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. Others can be found in the open literature (Deblois et al 2005; Mathieu et al 2005). Another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board).

All of the reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water based and synthetic drilling fluids as well as barite and bentonite which are major constituents of drilling muds, have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anarrobosis (e.g. from hydrogen sulfide), or for instance altered sediment texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g. primary productivity), fish quality and fish health. However as noted in the SEA, some attention should also be given to potential effects on ichthyoplankton and zooplankton as a major knowledge gap.

Polycyclic aromatic hydrocarbons are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g. gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH as noted in reviews by Payne et al, 2003 and Hylland 2006.

Furthermore, the toxic effects of PAH can be diverse covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al; 2007)

General

Given the intent of a SEA to form a basis for subsequent environmental assessment (EA) planning by providing much of the background environmental information that will be used for EA purposes and to focus on the needs for additional research where information gaps are identified, a SEA report must be held to the same standards of documentation and quality as the subsequent environmental assessments. However, many of the biological and ecological components of the draft SNL SEA are severely lacking in this required scientific rigor and documentation. Also in this respect, references are often lacking or improperly cited. For example, some conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced, while other references are cited using “as cited in” other reviews. With respect to the presentation of figures and tables, many of these lack sufficient detail for interpretation.

With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.

Specific comments

Section 2.1 Climatology

A discussion of storm surges should be included in this section.

Section 2.5 Geology

What is the location of the Eastern and Western Valleys? These should also be indicated by map or latitudes and longitudes.

Section 3.1 Fish Habitat

Coral reefs are also fish habitat and should be highlighted as such.

Laminarial communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan *Membranipora membranacea*. The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and response. This should be considered in the SNL SEA.

Section 3.1.2.2 Estuarine Algae

Benthic diatoms are commonly associated with intertidal sands and muds not deep water communities as presented in the SEA.

The community structure and composition of pelagic ecosystems in south coast estuaries is not properly documented here and requires elaboration.

Section 3.1.3 Plankton

This section shows a very poor understanding of planktonic communities and their ecology – much of the related discussion is an oversimplification that omits relevant details of community composition, succession and dynamics.

Since Station 27 is not located in or near the SEA area, if plankton dynamics are to be inferred from this station for the project area then the report must include a demonstration that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

The comment on diurnal migration refers to which groups of zooplankton?

Section 3.1.4 Benthic Invertebrates

This section presents a reference list only – there is no related synthesis or discussion.

Section 3.2 Fish

Stock status updates are not provided for cod or redfish.

Eels should be addressed specifically in the SEA. Available data for eels was used in the SARA assessment and shows trends over time.

Section 4.4 Potential Sources of Effects

The release of drilling wastes to the bottom should be addressed in this section.

References for the duration of measurable concentrations of drilling waste on the bottom need to be included in this discussion.

For the purposes of the discussion on offshore drilling the many wells of White Rose are used as a worst case scenario. It would be more appropriate to use the predictions developed for the individual EAs for exploratory wells on or near the Grand Banks in this case.

Section 4.5 Interactions and Potential Effects

Disposal of drill cuttings and mud has the potential to cause a HADD, and therefore should be discussed in this section.

The potential for taint of commercial fish should be discussed in this section.

With respect to rock placement, this is not always an acceptable habitat compensation in the Region.

The justification for creating habitat in a potentially contaminated area (near a drilling rig) needs to be discussed.

The reef effect and the attraction of fish to a potentially contaminated site needs to be discussed.

The effects of the fisheries exclusion zone need to be discussed.

The risks associated with the discharge of produced water are not solely related to hydrocarbons. The effects of nutrients, heavy metal and radioisotopes also need to be discussed.

Section 5.0 Cumulative effects

Specific effects of a single activity (e.g. drilling wastes) may be additive but the effects of several different components of a single activity or multiple activities may be synergistic. For example, sublethal hydrocarbon toxicity, nutrient loading and fishing pressure may affect fish trophodynamics and foodweb structure.

Where is the evidence that effects added by exploration and production activities will be negligible and not measurable? Reference?

Maps of existing and planned subsea cables should be included for these discussions.

3.2.2.8 Atlantic Salmon

Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers and 82 salmon populations occur within the two SFAs with fourteen scheduled rivers occurring within the SEA area." Also, "There has not been a recent individual assessment of the stocks...in the SEA area, however, stock status is estimated from a series of index rivers."

Additional information that should be incorporated into this section includes:

- Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area.
- There is a harvest (likely domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon. Given that St. Pierre et Miquelon has no salmon populations this is an inteceptory fishery on south coast stocks.

It should also be noted that COESWIC is presently reviewing Atlantic salmon.

3.3.1 Commercial Fisheries

The Atlantic salmon fishery only closed in 1992 and therefore should have some reference to historical commercial catch data.

American eels - reference is made to eel eggs being part of the Ictyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

3.3.3.

Brook trout (anadaramous form) are not referenced in text. The recreational fishery for brook trout is al least as valuable as the recreational Atlantic salmon fishery.

Templeman, Nadine

From: Worcester, Tana
Sent: September-28-09 1:07 PM
To: Templeman, Nadine
Subject: RE: SNL SEA Conference Call Review - FINAL SSR draft for approval

Me again. I just heard from Christie that COSEWIC is now waffling about whether they will assess loggerhead in Nov 2009 or April 2010, it keeps getting added and then dropped from the list. Perhaps reword to say:

The status of loggerhead turtle is under assessment by COSEWIC, and DFO is expected to conduct a Recovery Potential Assessment for loggerhead in 2010. Information from these assessments should be considered in future EAs in the SEA area.

I'm checking with Christie again to ensure this wording is ok. Will let you know.

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Centre for Science Advice - Maritimes Region (DFO)
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P: (902) 426-9920
F: (902) 426-5435

From: Worcester, Tana
Sent: September 28, 2009 12:14 PM
To: Templeman, Nadine
Subject: RE: SNL SEA Conference Call Review - FINAL SSR draft for approval

I might have some additional suggestions later, but on first glance I just noticed that the statement on loggerhead turtle isn't quite right:

Loggerhead Turtle- There is a COSEWIC RPA process currently underway for loggerhead seaturtle that, although not currently available, should be considered during future EAs in the SEA area.

The RPA process is a DFO process, not a COSEWIC one (not sure what is meant by COSEWIC PRA process).

It would be more accurate to say : "The status of loggerhead turtle is expected to be assessed by COSEWIC in November 2009, and DFO is planning to conduct a Recovery Potential Assessment of this species in 2010."

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From: Templeman, Nadine

Sent: September 28, 2009 9:28 AM

To: Templeman, Nadine; Healey, Brian; Murphy, Eugene; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Dwyer, Karen; Anderson, M. Robin; Worcester, Tana; Sutton-Pande, Vanessa; Lewis, Sara J; Grant, Carole

Subject: SNL SEA Conference Call Review - FINAL SSR draft for approval

Hi everyone,

I just wanted to thank you all for attending the SSR Draft review on Thursday, in making time to do so in your busy schedules, and for your patience and understanding in the later start. I really do recognize the difficulty in fitting some of these things in on short notice. I think that we had a fair representation of expertise in the room and felt that some useful discussion for finalizing the SSR ensued once we got on track. Overall, given the newer approach to the request, the short timelines, and the time of year we should be successful in putting forward a well coordinated branch response to Habitat, so thanks again!

I would particularly like to thank Vanessa for all of her assistance and support in putting this together :)

I have all changes incorporated into the final draft SSR ASAP for your approvals ~ I left the tracked changes and comments on from the call so you can follow where our conversation was going and why things were added/deleted/copied/changed. You may want to focus mainly on the changes in the opening and the conclusions sections as everything else was rather minor or straightforward in its editing. This document has **to be signed off by the RDS by COB today**, so I ask that **if you have any issues with this final draft that you get back to me by early this afternoon.**

Cheers,

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Templeman, Nadine

From: Dwyer, Karen
Sent: September-28-09 11:33 AM
To: Templeman, Nadine
Subject: RE: SNL SEA Conference Call Review - FINAL SSR draft for approval

Also Nadine, I told you that the reason for low catches of American plaice and yellowtail flounder (possibly 3NO cod but you'd have to ask Joanne if bycatch was lower for that species) in 2006 was because the yellowtail flounder fishery was undergoing "Industry restructuring". Please note the official phrasing is a "corporate restructuring and labour dispute".

From: Templeman, Nadine
Sent: Monday, September 28, 2009 9:58 AM
To: Templeman, Nadine; Healey, Brian; Murphy, Eugene; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Dwyer, Karen; Anderson, M. Robin; Worcester, Tana; Sutton-Pande, Vanessa; Lewis, Sara J; Grant, Carole
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Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Templeman, Nadine

From: Lewis, Sara J
Sent: September-28-09 11:18 AM
To: Templeman, Nadine
Subject: RE: SNL SEA Conference Call Review - FINAL SSR draft for approval
Attachments: SNL SEA SSRP (Draft) v 10 (Final draft)_sara.doc

Nadine,
I found a few minor things in the document. Nothing major, just thought you'd like to be aware.

Sara

From: Templeman, Nadine
Sent: Monday, September 28, 2009 9:58 AM
To: Templeman, Nadine; Healey, Brian; Murphy, Eugene; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Dwyer, Karen; Anderson, M. Robin; Worcester, Tana; Sutton-Pande, Vanessa; Lewis, Sara J; Grant, Carole
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Cheers,

Nadine.

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Science Response 2009/nnn

REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 16, 2009. Given that DFO is not the final advisory body for this request ((through the Canadian Environmental Assessment Act (CEAA) process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which that may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project-specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within

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the study area, including: many species of fish, fish habitat (including benthic habitat); commercial fisheries, marine mammals and sea turtles, species at risk and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and Response

General Remarks/Observations:

Given the intent of a SEA to form a basis for subsequent environmental assessment (EA) planning by providing much of the background environmental information that will be used for EA purposes and to focus on the needs for additional research where information gaps are identified, a SEA report must be held to the same standards of documentation and quality as the subsequent EAs. Often, the SEA document is referenced as the basic information for an area during an EA. Therefore, if the information in the original SEA is not correctly addressed and referenced, scientific review of subsequent documents has the potential to be cumbersome through the search for the pertinent information and/or the original statement that is being cited.

~~However, m~~Many of the biological and ecological components of the draft SNL SEA are severely lacking in this required scientific rigor and documentation. Also in this respect, references are often lacking, are out of date, or improperly cited. For example, some conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced, while other references are cited using "as cited in" other reviews. With respect to the presentation of figures and tables, many of these lack sufficient detail for interpretation.

It was also noted throughout the review that this draft SEA demonstrates some similar omissions gaps in the description of existing knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided for this Region does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential

impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are Northwest Atlantic Fisheries Organization (NAFO) sub-divisions, not Divisions. Additionally, it should be recognized that names common to some industries are not going to be common to all (e.g., locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the Stone Fence), are not common place to most. It is suggested that a map displaying all place names that are referenced within the document be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

Sea surface temperature (SST) at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not “clearly show” the Labrador Current, but at most “suggests” its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), Acoustic Doppler Current Profile (ADCP) results (Contact Dave Senciall, DFO) or calculated geostrophic currents from Conductivity, Temperature, Depth (CTD) data would be useful to in relaying the appropriate information.

When available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document. A discussion of storm surges should also be included in this section.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, ~~is there anyan~~ explanation for the negative correlation between the summer North Atlantic Oscillation (NAO) index and the storm occurrence on the CHC Response Zone would be useful?

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. This may not be particularly relevant to impacts within the study area but it could be relevant to distribution of discharges that were to occur along the north-western boundary of the SEA area.
~~However, this may not be particularly relevant to the study area.~~

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a Canadian Hydrographic Service (CHS) survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – see sea surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006) to address and highlight this interannual variability of the offshore Branch of the Labrador Current within the SEA.

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, "Fig. 2.18" in the text should read "2.28".

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only with the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

~~What is~~The location of the Eastern and Western Valleys ~~is not clear?~~ These should be indicated by either map or latitudes and longitudes in this section.

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, ~~it is not clear from the SEA why so much effort~~significant effort and detail was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that this knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information and its relationship to environmental impacts considerations could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

Coral reefs are also a fish habitat VEC and should be highlighted as such in the introduction of this section.

Zooplankton and phytoplankton are considered fish habitat throughout the SEA. It is unclear why – reasoning for this that should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Estuarine Algae - Overall, the community structure and composition of pelagic ecosystems in south coast estuaries is not adequately documented and requires elaboration.

Laminaral communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan *Membranipora membranacea*. The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and response. This should be considered in the SNL SEA – possibly through the addition and incorporation of a section specifically addressing this (and other) Invasive Species.

Also of note, benthic diatoms are commonly associated with intertidal sands and muds, not deep water communities as presented in the SEA.

Plankton (3.1.3)

This section ~~does not adequately describe~~ shows a very poor understanding of planktonic communities and their ecology – where much of the related discussion is an oversimplification that omits relevant details of community composition, succession and dynamics.

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters along the southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf; and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate since the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

It was also noted that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

Commented [T6]: Conclusion

More generally, since Station 27 is not located in or near the SEA area, if plankton dynamics are to be inferred from this station for the project area then the report must include a demonstration that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

Finally, it should be clarified if the comment on diurnal migration refers to which groups of zooplankton.?

Benthic invertebrates (3.1.4)

~~While the References for benthic invertebrates are dated in the SEA. While this is often common in addressing this topic in the NL Region, it should is also be recognized-noted that limited recent information may be available for consideration through unpublished benthic data (of non-commercial species) obtained during DFO RV surveys. With respect to the references that are providedincluded in this section, the document However, this section presents a reference list only – there is no related synthesis or discussion.~~

Commented [T7]: Reword – recent information sources.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the omission of this area for consideration within the overall context of the SEA, there is no mention of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Regarding the adjacent Scotian Shelf area, it would be useful to include a map showing the location of the Stone Fence (along with the representation of other coral areas).

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in ~~other some of these instances-species descriptions~~ as well.

Eels should be addressed specifically in the SEA. Available data for eels was used in the COSEWIC Assessment and Status Report (2006) SARA assessment and shows trends over time.

With respect to cod and redfish descriptions, stock status updates should be provided in the appropriate sections.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO SAR which is cited states, "CPUE changed little during 2004-2006 before decreasing in 2007". However, the most recent DFO Science Advisory Report (SAR) (DFO 2009a2009/045) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008b) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '*...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...*', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 week pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area. Additional information on sea cucumber in the Atlantic Region including Newfoundland waters, can be found in DFO (2009e) and Recent information pertaining to this species in the SEA area can be obtained from Stansbury and Hynick (2009).

Finfish (3.2.1.2)

Redfish- In the third paragraph, "...and (3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]..." Should read "...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]..." Also, "The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.", is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the [NAFO Divisions 3LNO](#) portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank." However, the majority of catch of yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

White Hake- Minor spelling error in first paragraph. "Cape Hatteras" should read "Cape Hatteras". Also, the statement "White hake are a temperate species at the limit of their temperature range and as a result are spatially restricted to the south western Grand Banks" is confusing and inconsistent with the previous statement that they range from Cape Hatteras to Southern Labrador. Perhaps reference to the SEA area would be helpful here.

Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by the [Committee on the Status of Endangered Wildlife Species in Canada \(COSEWIC\)](#), and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined [Designatable Unit \(DU\)](#), the SEA might consider reporting on the [research vessel](#) trends in each region individually.

Pollock- A more recent summary of information on pollock from [NAFO Divisions 4VWX5Z](#) is available in [DFO \(2003c\)](#) and [Stone et al. \(2009\)](#). More recent information on pollock from the [Maritime Region](#) is available in [DFO \(2009\)](#) and [Stone et al. \(2009\)](#).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is not in the SEA area, but no references to the Subarea 2 + [Divisions 3KLMNO](#) stock (assessed by NAFO) where [Division 3O](#) is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, "*it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$.*" does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPs4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "*These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...*", however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantic/witch-plie-eng.htm)

Haddock- The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Hagfish - Additional information on hagfish, including information from Newfoundland waters, can be found in DFO (2009a).

Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom,

spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sand Lance- For clarity and conciseness, suggested rewording of the section on sand lance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand lance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers *and 82 salmon populations* occur within the two SFAs with fourteen *scheduled rivers* occurring within the SEA area." Also, "There has not been a recent *individual* assessment of the stocks...in the SEA area, *however, stock status is estimated from a series of index rivers.*"

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interceptory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Snarks- Some minor edits in the information contained within this section are required. With respect to spiny dogfish, they congregate in the warmest available water (15°C) and the population are composed of both juveniles and mature adults. Regarding Port eagle snark it should be noted that they are found in the Laurentian Channel in spring, summer and fall and that the population size of the Northwest Atlantic population was estimated to range from 94,258 to 195,220 in 2005, which is approximately 10 to 24% of the population size.

the 1960s. Finally, the blue shark, *Isurus paucus*, appears to be most frequent in the spring to early summer season, but mature females are not seen in Canadian waters. Also, prices have been observed to occur over a wide seasonal range from spring to fall, presumably in the eastern Atlantic.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next ten years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans. This potential for error in basing conclusions on such a narrow timeframe is especially pertinent to the use of 2006/2007 RV collected in the area during those years due to incomplete survey information resulting from vessel problems there during the same timeframe. Given that this incomplete information is not used in DFO stock assessments, it would also be inappropriate for use in a SEA.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...They include deepwater redfish, thorny skate....", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In

addition, the 3NO cod stock is **permanently** closed to directed fishing, not for '*several months*' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American Eel – Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut- It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 30 within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e., 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American Plaice- Landings values in Figure 3.45 differ from values in the text. Could it be possible that the figure is describing American plaice harvest in Div. 3O only while the text is describing something else? These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used. In addition, consideration of industry restructuring is also pertinent to the use of 2006 bycatch landings values for American Plaice

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook Trout- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Marine Mammals (3.5)

The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was cited, the caveats associated with these data (listed much later in

the descriptive section) must be emphasized when statements such as "Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed cetacean species within the SEA Area (251 sightings of 3249 individuals)". While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as DFO must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years; the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution "patterns" are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast (see Lawson and Gosselin 2009).

With respect to specific statements on cetaceans, there have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement "Bottlenose whales were observed exclusively in offshore areas..." is not true incorrect. Also, until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area "...presumably represent components of the Scotian Shelf population". Regarding Blue whales, the statement "Blue whales were frequently observed in the SEA Area" is also incorrect as blue whales have been sighted here, but rarely. Finally, it should be included in the SEA that Sei whales have been seen close to shore in the SEA study area -- two sei whales were seen observed in Placentia Bay in July.

Overall, the SEA does address seals very well. This area is an important transit area for harp and hooded seals during the winter and spring. Therefore they are seasonally abundant and not always associated with ice. Harbour seals are common in the area.

However, hooded seals have been assessed as 'Not at Risk' by COSEWIC while harps have never been assessed. This information should be corrected in Table 3.20

Additionally, the comment that grey seals are breeding on St. Pierre and Miquelon is not accurate. There have been a number of surveys that indicate few, if any, pups are born in the area. The total population of grey seals in the NW Atlantic is approximately 300,000 (not unknown - Table 3.16). This is available in a 2008 CSAS Research Document. The number present in the area is estimated from Hammill (2005) which provides estimates of abundance (that have been updated). Still, this cannot be used to estimate the total number of seals likely to be found in the area.

Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American Plaice- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote "a" after NL, but the footnote is not included.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Div.Subdivision 3Ps in the SEA, there is no information on plaice in Division 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

Leatherback Turtle- The large-scale aerial survey conducted in the late summer of 2007 (Lawson and Gosselin, 2009) provided data which allowed a minimal estimate of leatherback turtle abundance. For the south coast of Newfoundland survey stratum only, it was estimated that there were at least 700 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the consistent long-term use of this area in the summer and early fall by feeding turtles, and the seasonal abundance of primary turtle prey (jellyfish), is suggestive that the Newfoundland south coast might be considered critical habitat. Consideration of critical habitat will occur this week (Sept. 25, 2009) during a conference call with the federal leatherback turtle working group to update the Leatherback Action Plan to include critical habitat designations.

The text on page 221 does not include the leatherback sightings made during the 2007 aerial survey, and more recent data from other sources, but the overall pattern of most leatherbacks being on the south coast of Newfoundland will remain the same.

Loggerhead Turtle- There is a COSEWIC RPA process currently underway for loggerhead seaturtle that, although not currently available, should be considered during future EAs in the SEA area.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing Large Ocean Management Area (LOMA) boundaries should be included in the SEA for both NL and Maritimes Regions. In addition, LOMAs are **thousands** of square kilometres in size, not *hundreds* as stated in the SEA.

Ecologically and Biologically Significant Areas (EBSAs) (3.8.2)

It is more appropriate for this section to be titled EBSAs, AOIs, and Marine Protected Areas (MPAs) and include greater detail and discussion on the processes and implications of EBSAs.

establishing MPAs and MPA Networks. Also, six new MPAs are to be established under the Health of the Oceans (HOTO) initiative, not *nine* as stated in the SEA. Further information on the potential management implications of these initiatives can be obtained from the DFO Oceans Sector.

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

Canacian Parks and Wilderness Society (CPAWS): Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area. Also in this table, more recent information indicates that the Southeast Shoal is no longer considered nursery habitat for American Plaice as stated in the text (K. Dwyer pers. comm.).

As mentioned previously, the south coast of Newfoundland – particularly in the St. Pierre Bank area – is under consideration as critical habitat for leatherback sea turtles as a feeding area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cuttings under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al 2005; Mathieu et al 2005), and another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anoxia (e.g. from hydrogen sulfide), or for instance altered sediment

texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g. primary productivity), fish quality and fish health. However, given the large amount of available literature on this topic this section could have included more detail in the assessment. However Also as noted in the SEA, some further attention should also be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g. gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al 2007).

In Table 4.4, it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

Production Phase (4.2)

The SEA states, "All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast." Therefore, ship traffic from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Potential Sources of Effects from Routine Activities (4.4)

The release of drilling wastes to the bottom should be addressed in this section, and references for the duration of measurable concentrations of drilling waste on the bottom need to be included.

For the purposes of the discussion on offshore drilling the many wells of White Rose are used as a worst case scenario. It would be more appropriate to use the predictions developed for the individual EAs for exploratory wells on or near the Grand Banks in this case.

Interactions and Potential Effects of Routine Activities (4.5)

The use and effects of antifouling agents (on and offshore) should be discussed within the SEA in this section.

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

This discussion on sound mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long-term effects of exposure to deleterious levels of sound from these blasts.

On page 270 – there is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect must be removed.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

The disposal of drill cuttings and mud has the potential to cause a Harmful Alteration Disruption or Destruction (HADD), and therefore should be discussed in the section on Fish, Fish Habitat and Fisheries. The potential for taint of commercial fish should be discussed in this section.

Effects on Bottom Disturbance (4.5.3)

With respect to fish habitat, rock placement is not always an acceptable habitat compensation in the Region, and comes across as implied in this section. Other areas requiring discussion in this section include the the justification for creating habitat in a potentially contaminated area

(near a drilling rig); the reef effect and the attraction of fish to a potentially contaminated site; and the effects of the fisheries exclusion zone.

Effects of Produced Water (4.5.4)

The risks associated with the discharge of produced water are not solely related to hydrocarbons. The effects of nutrients, heavy metals and radioisotopes also need to be discussed.

Effects of Presence of Structures (4.5.6)

Regarding the artificial-reef-effect and related scientific evidence, it would be necessary to conduct multi-year monitoring to demonstrate potential effects, the most important component of such monitoring being pre-data. That is, a Before-After-Control-Impact Design would be required, where data would be collected (probably for 3 years) before any construction takes place, followed by additional data collection after construction is completed. Furthermore, control sites should accompany this monitoring in areas that will not be affected. This study design is currently being conducted in relation to wharf and breakwater constructions in Newfoundland to assist in the determination of EAs and ~~Harmful Alteration Disruption and Destruction (HADD)~~ implications.

To take advantage of science-based input, there should be discussions surrounding planned activities, and monitoring, long before (i.e. 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to the SEA process rather than the EA process if the general impacts can be identified early on.

Effects of Marine Vessel Presence (4.5.9)

The SEA states, "There is no interaction between presence of marine vessels and the Fish VEC." This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries. The SEA is very limited in addressing each of these potentially important coastal interactions.

Accidental Hydrocarbon Releases (4.6)

Interactions and Potential Effects of Accidental Hydrocarbon Releases (4.6.4)

~~American Lobster~~- Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and molting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

There is little data to investigate the possibility that the prey of leatherbacks might become contaminated. Given that leatherback turtles are known to consume anthropogenic debris, it is

possible they might eat hydrocarbon products such as tar mats or tar balls., in addition to oiled jellyfish.

Cumulative Effects (5.0):

Specific effects of a single activity (e.g. drilling wastes) may be additive but the effects of several different components of a single activity or multiple activities may be synergistic. For example, sublethal hydrocarbon toxicity, nutrient loading and fishing pressure may affect fish trophodynamics and foodweb structure.

~~References are required to substantiate the Also, where is the evidence statement that effects added by exploration and production activities will be negligible and not measurable.?~~
Reference?

Commented [T14]: Rephrase this as a statement.

Maps of existing and planned subsea cables should be included for these discussions.

Commercial, Research and Recreational Fisheries and Aquaculture (5.2)

"Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production". This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Subsea Cables (5.7)

Maps of existing and planned subsea cables should be included in this section.

Conclusions (6.0):

Planning Implications (6.2)

Identified Potentially Sensitive Areas (6.2.1)

Sensitive areas identified in the SEA do not include DFO ~~Oceans Act Marine Protected Areas (MPAs)~~MPAs or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, ~~EC~~Environment Canada, and Parks Canada) and should therefore be considered independent of DFO's identification of EBSAs.

Addressing Data Gaps (6.4)

The SEA refers to monitoring that is specific to EAs. Where possible, it should be acknowledged that mitigation measures can be improved by early monitoring that takes place before the EA process. The SEA process may identify and enable early planning initiatives to improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the "artificial-reef" idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 3O). Throughout the review it is not clear as to what is being updated and what is new.

Conclusions

- Given that the current SEA area includes, and is an extension of, the Laurentian sub-basin SEA and the Sydney Basin SEA that have been reviewed by DFO in recent years, previous SEA areas that have been addressed in recent years, many of the comments provided by DFO Science in relation for those previous SEA reviews at earlier dates have been considered and addressed in this latest assessment and a number of sections have been greatly enhanced with more recent information (e.g., the seismic section). In addition, the Southern Newfoundland SEA effectively acknowledges the diversity of issues surrounding potential petroleum exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.
- However, the current Southern Newfoundland SEA still contains some similar gaps in knowledge omissions in the description of existing knowledge and analysis and analysis present in reports preceding this, do still exist. This Science Special Response has focused on these omissions and additional suggestions for improvement are provided.
- A significant shortcoming in the Southern Newfoundland SEA is the failure to address some vital coastal areas, especially Placentia Bay, that have been proven to provide important fish habitat, and that could be at increased risk of impact should the production stage include transshipment and storage of product at nearby shore-based facilities, as per the agreed scope of the SEA.
- With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.
- Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible. Given natural variations in the state of the ocean, analyzing multi-year data sets in order to obtain some indication of the level of inter-annual variability in the area is often more appropriate than using shorter timeframes (e.g. 2006/2007) as benchmarks for assessing potential impacts, unless there is specific rationale for doing so. Many of the key physical and biological components contained in

the SEA do have significant amounts of data available that should be incorporated into describing, or at least considering, trends in the assessment.

~~The CNLOPB~~Major impacts may have been adequately assessed; however, there are areas sections of the SEA that lacked sufficient detail to qualify/quantify other risks (e.g., potential impacts to vulnerable species and sensitive areas) that might require addressing at the EA stageadditional analysis at the project EA stage through a combination of identified data gaps and omissions

-
- The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program.
- Recognizing that the remit for the SEA provides a specific area for consideration, some statements in the Science review of the SEA document may include comments pertaining to areas outside of the remit by reference to adjacent areas. However, in some cases it is difficult not to address species and stocks that are in close proximity to the SEA area as DFO assesses stocks based on other boundaries that different from the SEA boundaries, allowing for some assessment areas to overlap with the SEA area. In these instances it is the intention of the review to highlight issues pertaining to areas immediately adjacent to the SEA boundary.

Commented [T17]: Conclusion

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Fran Mowbray	Reviewer	DFO Science, NL Region
Eugene Murphy	Reviewer	DFO Science, NL Region
Brian Nakashima	Reviewer	DFO Science, NL Region
Jerry Payne	Reviewer	DFO Science, NL Region
Pierre Pepin	Reviewer	DFO Science, NL Region
Brian Petrie	Reviewer	DFO Science, Maritimes Region
Don Power	Reviewer	DFO Science, NL Region
Jim Simon	Reviewer	DFO Science, Maritimes Region
Mark Simpson	Reviewer	DFO Science, NL Region
Don Stansbury	Reviewer	DFO Science, NL Region
Garry Stenson	Reviewer	DFO Science, NL Region
John Wheeler	Reviewer	DFO Science, NL Region

Approved by

Dr. Jay Parsons
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Date: September 28, 2009

Sources of information

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Templeman, Nadine

From: Dwyer, Karen
Sent: September-28-09 10:59 AM
To: Templeman, Nadine
Subject: RE: SNL SEA Conference Call Review - FINAL SSR draft for approval

Hi Nadine

If you recall I said I would get you a reference for a couple of the items in the table regarding the SE shoal, p. 232 (I believe). This is what Joanne says:

Hi Karen. As Eugene says the amount of young cod has been very limited over the last couple of decades. Analyses that were done showed that the spatial and temporal pattern of juvenile cod distribution was quite variable and in only 1 of the 10 years analyzed was more than 50% of the cod found on the southeast shoal. For plaice there was a large shift in the location of juveniles when the stock declined from being located adjacent to the shoal to being off shoal.

Walsh, S.J., M. Simpson, M.J. Morgan, K.S. Dwyer, and D. Stansbury. 2001. Distribution of juvenile yellowtail flounder, American plaice and Atlantic \\\

Walsh, S.J., M. Simpson, M.J. Morgan, K.S. Dwyer, and D. Stansbury. 2001. Distribution of juvenile yellowtail flounder, American plaice and Atlantic cod on the southern Grand Bank: a discussion of nursery areas and marine protected areas. NAFO SCR Doc. 01/78.

As for haddock concentration, Eugene says the following:

Haddock when they were more abundant occupied the area now occupied by yellowtail. In the last 20+ years we have not seen enough cod or haddock to make definitive statements about nursery areas.

Hope this helps. I will try to read over your changes, but we are flat out getting ready for the Cod RAP tomorrow.

Karen

From: Templeman, Nadine
Sent: Monday, September 28, 2009 9:58 AM
To: Templeman, Nadine; Healey, Brian; Murphy, Eugene; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Dwyer, Karen; Anderson, M. Robin; Worcester, Tana; Sutton-Pande, Vanessa; Lewis, Sara J; Grant, Carole
Subject: SNL SEA Conference Call Review - FINAL SSR draft for approval

Hi everyone,

I just wanted to thank you all for attending the SSR Draft review on Thursday, in making time to do so in your busy schedules, and for your patience and understanding in the later start. I really do recognize the difficulty in fitting some of these things in on short notice. I think that we had a fair representation of expertise in the room and felt that some useful discussion for finalizing the SSR ensued once we got on track. Overall, given the newer approach to the request, the

short timelines, and the time of year we should be successful in putting forward a well coordinated branch response to Habitat, so thanks again!

I would particulaly like to thank Vanessa for all of her assitance and support in putting this together :)

I have all changes incorporated into the final draft SSR ASAP for your approvals ~ I left the tracked changes and comments on from the call so you can follow where our conversation was going and why things were added/deleted/copied/changed. You may want to focus mainly on the changes in the opening and the conclusions sections as everything else was rather minor or straightforward in its editing. This document has **to be signed off by the RDS by COB today**, so I ask that **if you have any issues with this final draft that you get back to me by early this afternoon.**

Cheers,

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP

Templeman, Nadine

From: Templeman, Nadine
Sent: September-28-09 9:58 AM
To: Templeman, Nadine; Healey, Brian; Murphy, Eugene; Payne, Jerry F; Morgan, Joanne; Lawson, Jack; Dwyer, Karen; Anderson, M. Robin; Worcester, Tana; Sutton-Pande, Vanessa; Lewis, Sara J; Grant, Carole
Subject: SNL SEA Conference Call Review - FINAL SSR draft for approval
Attachments: SNL SEA SSRP (Draft) v.10 (Final draft).doc

Hi everyone,

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Cheers,

Nadine.

Chair, Southern Newfoundland Strategic Environmental Assessment SSRP



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Canadian Science Advisory Secretariat
Science Response 2009/nnn

REVIEW OF THE SOUTHERN NEWFOUNDLAND STRATEGIC ENVIRONMENTAL ASSESSMENT

Context

DFO Science was called upon by the Oceans, Habitat, and Species at Risk (OHSAR) Branch to review the Canada-Newfoundland and Labrador Offshore Petroleum Board's (CNLOPB's) "Southern Newfoundland Strategic Environmental Assessment" (SNL SEA). Previous to this, a Scoping Document for the SNL SEA was prepared by CNLOPB with the assistance of a working group consisting of members from federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry, and non-governmental organizations to provide an outline of factors to be considered in the SEA, the scope of those factors, and guidelines for the preparation of the SEA report, and provides a framework for which a review can be carried out. The SNL SEA was drafted by LGL Limited and released for public review on August 20, 2009 (http://www.cnlopb.nl.ca/env_strategic.shtml), with a response deadline of September 16, 2009. Given that DFO is not the final advisory body for this request ((through the Canadian Environmental Assessment Act (CEAA) process), the short timeline to carry out a review, and since reviews of previous CNLOPB SEA reports in the Region have been provided by DFO Science in the past, it was determined that the Special Science Response Process (SSRP) should be used.

Background

A SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which that may be associated with a plan, program or policy proposal and allows for the incorporation of environmental considerations at the earliest stages of program planning, and therefore considers the larger ecological setting, rather than a project-specific environmental assessment that focuses on site-specific issues with defined boundaries. In this particular case, information from the SEA will assist the CNLOPB in determining whether further exploration rights should be issued in whole or in part within the SNL SEA Area and may identify general restrictive or mitigative measures that should be considered for application to consequent exploration activities.

Although subsequent activities still require the specific approval of the CNLOPB, including a project-specific environmental assessment (EA) of its associated environmental effects, the SEA assists in streamlining and focusing these EAs by providing an overview of the existing environment, discussing in broader terms the potential environmental effects associated with offshore oil and gas activities in the Southern Newfoundland SEA Area, identifying knowledge and data gaps, highlighting issues of concern, and making recommendations for mitigation and planning.

The effects of offshore petroleum projects on the immediate marine environment are of interest to DFO as there are a broad range of Valued Ecosystem Components (VECs) occurring within

September 2009

Canada

the study area, including: many species of fish, fish habitat (including benthic habitat); commercial fisheries, marine mammals and sea turtles, species at risk and sensitive areas. This Science Response includes a review of the proponent's evaluation of the physical and biological marine environment, exploration and production associated environmental effects, and cumulative effects – focusing on associated data gaps and inconsistencies that might occur within the report.

Analysis and Response

General Remarks/Observations:

Given the intent of a SEA to form a basis for subsequent environmental assessment (EA) planning by providing much of the background environmental information that will be used for EA purposes and to focus on the needs for additional research where information gaps are identified, a SEA report must be held to the same standards of documentation and quality as the subsequent EAs. Often, the SEA document is referenced as the basic information for an EA during an EA. Therefore, if the information in the original SEA is not correct, addressed and referenced, scientific review of subsequent documents has the potential to be cumbersome through the sea on for the pertinent information and the original statement that is being cited.

However, many of the biological and ecological components of the draft SNL SEA are severely lacking in this required scientific rigor and documentation. Also in this respect, references are often lacking, are out of date, or improperly cited. For example, some conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced, while other references are cited using "as cited in" other reviews. With respect to the presentation of figures and tables, many of these lack sufficient detail for interpretation.

It was also noted throughout the review that this draft SEA demonstrates some similar omissions gaps in the description of existing knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded the CNLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion (and dismissal) of potential cumulative effects.

In general, there is not a large amount of information from the Maritimes Region contained within this SEA. Information that is provided for this Region does seem to be reasonably accurate and complete. However, further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA. Potential implications of oceanographic conditions and dynamics for planning and impacts of human activities are not fully explored.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential

impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are North west Atlantic Fisheries Organization (NAFO) sub-divisions, not Divisions. Additionally, it should be recognized that names common to some industries are not going to be common to all, e.g. locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the Stone Ferret are not common-place to most. It is suggested that a map displaying all place names that are referenced within the document be included in the SEA.

Introduction (1.0):

Scoping (1.2)

The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

Based on the above observation, it is suggested that the area for the SEA be extended to the southern coast of Newfoundland, including Placentia Bay. The SEA identifies shipping routes to the Newfoundland coast (Placentia Bay specifically) to support potential southern Newfoundland platforms, explorations, and transport. Therefore, it is important to include Placentia Bay in the SEA to allow for early stage planning that could mitigate future cumulative effects.

Physical Environment (2.0):

Climatology (2.1)

Sea surface temperature (SST) at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

The temperature pattern in Figure 2.26 does not "clearly show" the Labrador Current, but at most "suggests" its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), Acoustic Doppler Current Profile (ADCP) results (Contact Dave Senciall, DFO) or calculated geostrophic currents from Conductivity, Temperature, Depth (CTD) data would be useful to in relaying the appropriate information.

When available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document. A discussion of storm surges should also be included in this section.

Sea Spray Vessel Icing (2.1.7)

If available, local observational data should be used for calibration of the algorithm for the frequency of potential icing conditions in the SEA area.

Tropical Systems (2.1.8)

In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, is there ~~any~~ explanation for the negative correlation between the summer North Atlantic Oscillation (NAO) index and the storm occurrence on the CHC Response Zone would be useful?

Physical Oceanography (2.2)

Figure 2.16, is supposed to represent the main feature of the surface circulation in the western Atlantic (not just the SEA), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. This may not be particularly relevant to impacts within the study area but it could be relevant to a study of disturbances that were to occur along the north-western boundary of the SEA area.
~~However, this may not be particularly relevant to the study area.~~

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of datasets or from a Canadian Hydrographic Service (CHS) survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Currents (2.2.1)

The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – see sea surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006) to address and highlight this interannual variability of the offshore Branch of the Labrador Current within the SEA.

Ice (2.3)

Sea Ice (2.3.2)

Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, "Fig. 2.18" in the text should read "2.28".

Icebergs (2.3.3)

Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

Bathymetry (2.4)

Place names and identifying features are presented only with the actual SEA area, although areas outside this area are described throughout the document. Features within the Maritimes Region (e.g., Stone Fence) that are described elsewhere in the report could be identified within the representation here.

Geology (2.5)

A quality description of the geology of the area is provided, but no linkages are made with the implications of this information for the evaluation of potential project impacts (either in this section or in the planning implications).

What is the location of the Eastern and Western Valleys, is not clear? These should be indicated by either map or latitudes and longitudes in this section.

Planning Implications (2.7)

Physical Oceanography (2.7.2)

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque. Current meter data should be collected over the deep slope to validate any oceanographic conclusions used for planning.

With respect to temperature characteristics of the area, it is not clear from the SEA why so much effort and detail was put into describing the temperature profiles of the region. While not explicitly stated, this section seems to imply that this knowledge of physical oceanography is important primarily to assist with understanding of potential impacts of the environment on the operations within the area rather than to assist with understanding of potential impacts of projects on the environment. Therefore, rationale for inclusion of temperature and salinity information and its relationship to environmental impacts considerations could be strengthened.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment:

3.1 Fish Habitat

Coral reefs are also a fish habitat VEC and should be highlighted as such in the introduction of this section.

Zooplankton and phytoplankton are considered fish habitat throughout the SEA. It is unclear why – reasoning for this that should be elaborated upon if for certain planning or other purposes.

Coastal Algal Communities (3.1.2)

With respect to habitat, increased emphasis should be placed on the role of eelgrass and other near shore habitats and communities within the SEA. For example, eelgrass has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

Estuarine Algae - Overall, the community structure and composition of pelagic ecosystems in south coast estuaries is not adequately documented and requires elaboration.

Laminaral communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan *Membranipora membranacea*. The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and response. This should be considered in the SNL SEA – possibly through the addition and incorporation of a section specifically addressing this (and other invasive species).

Also of note, benthic diatoms are commonly associated with intertidal sands and muds, not deep water communities as presented in the SEA.

Plankton (3.1.3)

This section does not adequately describe shows a very poor understanding of planktonic communities and their ecology – where much of the related discussion is an oversimplification that omits relevant details of community composition, succession and dynamics.

Numerous oversights exist in the section on plankton that must be taken into careful consideration for the planning of exploration and production activities, and in the development of mitigation and monitoring strategies, for the SEA to be thorough in its consideration of the biological environment.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report has failed to consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters along the southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf; and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. This level of information is inadequate since the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area requires a quantification of the underlying variability in plankton abundance. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system, that is based on collections from ships-of-opportunity, is varied and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Only through acknowledging the underlying variability would it be possible to assess whether changes that occur during and after exploration activities are within the bounds of the natural variability that has been observed prior to the program. Of additional concern in the current draft document is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

It was also noted that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

Commented [T6]: Conclusion

More generally, since Station 27 is not located in or near the SEA area, if plankton dynamics are to be inferred from this station for the project area then the report must include a demonstration that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

Finally, the comment on diurnal migration refers to which groups of zooplankton?

Benthic invertebrates (3.1.4)

References for benthic invertebrates are dated in the SEA. ~~While this section~~ ~~quoting or discussing findings in the NL Region, it should be also be recognized that~~ ~~limited recent information may be available for consideration and, in particular, data~~ ~~(of non-commercial species, obtained from DFO RV surveys, etc., regarding the reefs)~~ ~~that are provided in this section, the document however, the section presents a~~ reference list only – there is no related synthesis or discussion.

Commented [T7]: Reword – recent information sources.

In a previous review for the Laurentian Subbasin SEA, which is part of the same area, it was suggested the document provide inclusion of results from DFO RV surveys, as well as results from the DFO Banquereau clam dredging experiment and comparisons of these with other areas to enhance information on distribution of benthic invertebrates.

With respect to benthic considerations for coastal areas, some of the information cited in the SEA considers the southern and South eastern coastal areas of Newfoundland (e.g., Hardy 1985, LeDrew 1984), but again does not specifically include Placentia Bay. Likely due to the omission of this area for consideration within the overall context of the SEA, there is no mention of benthic (or other) invasive species, such as green crab, within the document. This omission again highlights the requirement for the SEA to more adequately address the coastal areas of southern Newfoundland. A suggested solution to this shortfall, if not able to be adequately addressed within the final draft of the current SEA, is that a separate SEA for Placentia Bay alone be conducted so the resulting information could then be integrated with those projects that depend on Placentia Bay. Although Transport Canada has already carried out an assessment of sorts for this coastal area, its depth is not as great as that required to address the potential for specific ecosystem effects at the same level as the SEA for Southern Newfoundland.

Regarding the adjacent Scotian Shelf area, it would be useful to include a map showing the location of the Stone Fence (along with the representation of other coral areas).

Also, lobster in this section is mentioned without reference to its scientific name, *Homarus americanus*. Since other lobster species are mentioned later on in the document, it would be useful to be specific here.

(Fish Habitat) Planning Implications (3.1.5)

It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.2 Fish

The section on fish makes no mention of snow crab, Iceland scallops, sea-scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in ~~other~~ ~~some of these instances species descriptions as well.~~

Eels should be addressed specifically in the SEA. Available data for eels was used in the COSEWIC Assessment and Status Report (2006) SARA assessment and shows trends over time.

With respect to cod and redfish descriptions, stock status updates should be provided in the appropriate sections.

Macroinvertebrates (3.2.1.1)

Snow Crab- The statement referring to total catch per unit of effort (CPUE) for snow crab is incorrect. The 2008 DFO SAR which is cited states, "CPUE changed little during 2004-2006 before decreasing in 2007". However, the most recent DFO Science Advisory Report (SAR) (DFO 2009a2009/045) states, "CPUE has declined since 2002, to its lowest level in 2008". Citing DFO (2008) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop- The reference to "Newfoundland's large offshore banks" should be removed from the reference. St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops- The SEA states '*...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...*', and cites Ollerhead et al. 2004, stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to 'maturity' should be removed.

The SEA also cites Ollerhead et. al 2004 for time of spawning of Iceland scallop on St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the Ollerhead statement is "Iceland scallop are known to spawn in the late summer" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, citation DFO 2006b should read 2006d.

American lobster- This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Also with respect to lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the "timing of Spawning" column. This should be corrected to reference spawning explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "Larvae have a 6-10 pelagic stage" should read, "Larvae have a 6-10 week pelagic stage"

Orange footed Sea Cucumber- The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area. Additional information on sea cucumber in the Atlantic Region including Newfoundland waters can be found in DFO (2005e) and Recent information pertaining to the species in the SEA area can be obtained from Stansbury and Hynick (2009).

Finfish (3.2.1.2)

Redfish- In the third paragraph, "...and (3) Laurentian Channel – Unit2 which includes 3Pn3Ps4Vns [June-Dec.]..." Should read "...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]..." Also, "The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council," is a quite a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

In the fourth paragraph, the time-series for data collection by Ollerhead et al. should read 1998-2002 not 1995-2002.

Yellowtail Flounder- Yellowtail flounder in the [NAFO Divisions 3LNO](#) portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on yellowtail spawning has been updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to yellowtail, the SEA states, "Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank." However, the majority of catch of yellowtail (about 10000 t+ since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank).

White Hake- Minor spelling error in first paragraph: Cape halterias should read Cape Hatteras. Also the statement: "White hake are a temperate species at the limit of their temperature range and as a result are seasonally restricted to the southern western Grand Banks" is confusing and inconsistent with the previous statement that they range from Cape Hatteras to Southern Labrador. Perhaps reference to the SEA area would be more precise.

Skates- Winter skate and barndoor skate should be described as uncommon or even rare on the Grand Banks. Winter skate on the Grand Banks were considered 'data deficient' by the [Committee on the Status of Endangered Wildlife Species in Canada \(COSEWIC\)](#), and the % occurrence is very low. Barndoor skate are currently under review by COSEWIC. With respect to thorny skate, the SEA initially describes their distribution as relatively continuous, but then goes on to state that the stock had become concentrated in a small area on the southern Grand Bank. For smooth skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on smooth skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined [Designatable Unit \(DU\)](#), the SEA might consider reporting on the [research vessel-RV](#) trends in each region individually.

Pollock- A more recent summary of information on pollock from NAFO Divisions 4VWX5Z is available in DFO (2003c), and Store et al. (2009). More recent information on pollock from the Maritime Region is available in DFO (2008) and Store et al. (2006).

Greenland Halibut- This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is not in the SEA area, but no references to the Subarea 2 + [Divisions 3KLMNO](#) stock (assessed by NAFO) where [Division 3O](#) is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland halibut in sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland halibut description in Table 3.2.

Atlantic Halibut- The description of knowledge about Atlantic halibut spawning is perhaps overly confident. The statement, "*it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$.*" does not convey an appropriate level of uncertainty. While spent and ripening halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in fall may be associated with spawning, while the more shallow distributions in spring suggests that halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPs4VWX5Zc is not, which may be more relevant to this topic.

Witch flounder- This section discusses only the 3Ps stock and has no information on the witch flounder stock that resides in Div. 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "*These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...*", however, witch flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantic/witch-plie-eng.htm)

Haddock- The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. 2004. However, this is incorrect as the maps in Ollerhead et al. showing April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within in the SEA Area.

Haddock - Additional information on haddock, including information from Newfoundland waters can be found at DFO (2009a).

Bluefin Tuna- More recent information (i.e., since 2001) has been published and is available on bluefin tuna.

Non-Commercial Species (3.2.2)

Capelin- While the SEA correctly states that no commercial fishery for capelin occurs within the SNL SEA boundary, there are portions of 2 stocks of capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawn at 5-8.5 °C but have been observed to spawn at 4-10 °C. On the bottom,

spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Capelin feeding occurs throughout the summer, fall, and early winter. They stop feeding in winter and resume feeding in the spring as water temperatures warm. Maturing capelin will feed until a few days before they are ready to spawn. Those females that survive spawning may resume feeding afterwards but the males do not.

Recent variations in year class strength for capelin have been linked to environmental factors affecting survival and release of larvae from beach and bottom substrates, early on in their life history. Several publications support this hypothesis.

Sand Lance- For clarity and conciseness, suggested rewording of the section on sand lance is as follows: "Sand lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand lance spawn *demersally* within this section of the SEA.

Atlantic Salmon- Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers and 82 salmon populations occur within the two SFAs with fourteen scheduled rivers occurring within the SEA area." Also, "There has not been a recent individual assessment of the stocks...in the SEA area, however, stock status is estimated from a series of index rivers."

It should also be included in this section that i) Atlantic salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely domestic) of Atlantic salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no salmon populations this would be an interceptory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic salmon.

Finally, since the fishery for Atlantic salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Sharks- Some minor edits on the information contained within this section are required. With respect to spiny dogfish, they congregate in the warmest available water (>5°C) and the population are comprised of both juveniles and mature adults. In regards to Porbeagle shark, it should be noted that they are found in the Laurentian Channel in spring, summer and fall, and that the population size of the Northwest Atlantic population was estimated to range from 94,309 to 195,230 fish in 2005, which is approximately 10 to 24% of the population size in

the 1960s. Finally, for blue shark, mating appears to be most frequent in the spring to early summer season, but mature females are not seen in Canadian waters. Also, births have been observed to occur over a wide seasonal range from spring to fall, presumably in the eastern Atlantic.

Macroinvertebrate and Fish Spawning (3.2.3)

The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic cod in a spatial sense. For example, in Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

DFO Research Vessel (RV) Surveys (3.2.4)

The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next ten years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans. The potential for error in basing conclusions on such a narrow timeframe is especially pertinent to the use of 2006/2007 RV collected data in the area during those years due to incomplete survey information resulting from vessel problems during the same timeframe. Given that this incomplete information is not used in DFO stock assessments, it would also be inappropriate for use in a SEA.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

Catch Weight (3.2.4.1)

This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, "...They include deepwater redfish, thorny skate....", "deepwater" should be removed from the description of redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden redfish (*Sebastes marinus*) are obvious. Since it appears LGL utilized the DFO database, what is coded in our RV database with a species code of '0794' is really a mixture of *Sebastes mentella* (deepwater redfish) and *S. fasciatus* (Acadian redfish).

(Fish) Planning implications (3.2.5)

With respect to the statement, "...Directed cod and redfish fisheries in the SEA area are closed for several months each year due to declining stocks...", DFO Fisheries and Aquaculture Management Branch should be contacted for clarification on why redfish and cod fisheries are closed for several months each year rather than ascribing the reason to declining stocks. In

addition, the 3NO cod stock is **permanently** closed to directed fishing, not for '*several months*' as stated in the SEA.

Table 3.2 in this section also requires the addition of more information for Redfish under "Timing of Spawning" - owing to their unique reproductive biology. Redfish are ovo-viviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under "Eggs/Larvae" in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

(Fish) Data Gaps (3.2.6)

Uncertainty in the drift paths for ichthyoplankton and macroinvertebrate eggs/larvae in the area is of similar concern to that raised for secondary producers in section 3.1.3. Therefore, the downstream impact of either longer-term low level or short-term high-intensity contamination on regional production of the elements of the lower food web are again highly uncertain based on this report.

With respect to scallops, the reference to "*last full assessment*" is ambiguous in its context. Although this comment is taken directly from the reference cited, the context of the SAR is for Iceland Scallop in the CORE Area on St. Pierre Bank **only**. The authors are correct however, in that Iceland Scallop has not been assessed for the entire St. Pierre Bank for quite some time.

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region from the way the information has been presented, and since not all landings are georeferenced, maps may be an under-representation.

The sections provided on fisheries also make no mention of those that may occur immediately adjacent to the SEA area, but that might be impacted by activities conducted within the SEA. For example, fishing on Banquereau Bank is not discussed.

Finally, it could be useful to briefly describe the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses'.

Figure 3.14 requires the addition of units for quantity - numbers or weights

Commercial Fisheries (3.3.1)

American Eel – Reference is made to eel eggs being part of the ichthyoplankton. Eels are a commercial species and as such deserve a specific species write up. COESWIC is also presently reviewing the status of American eels.

Greenland Halibut- It appears that the SEA does not include any statistics for from NAFO member states fishing Greenland Halibut within the portion of Division 30 within the NAFO regulatory Area (i.e. Outside 200mi).

Sea Scallop- Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e., 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

Yellowtail Flounder- Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American Plaice- Landings values in Figure 3.45 differ from values in the text. Could it be possible that the figure be is describing American plaice harvest in Div. 3O only while the text is describing something else? These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used. In addition, consideration of industry restructuring is also pertinent to the use of 2006 bycatch landings values for American Plaice.

Hagfish- Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 tons (over 700t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Recreational Fisheries (3.3.3)

Brook Trout- The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic salmon fishery.

Capelin- Recreationally, capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

(Fisheries) Data Gaps (3.3.6)

It should be noted both at the beginning of commercial fisheries section and when discussing data gaps that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

Lobster- The Sydney Basin SEA Study Area, within the SNL SEA, includes all of Lobster Fishing Area (LFA) 12, and a portion of LFA 11. These two areas have experienced significant increases in reported landings in recent years. Unfortunately, severe data gaps exist for the American lobster fishery in these areas. Limited voluntary logbook coverage in both LFA 11 and 12, along with localized detailed at-sea sampling in LFA 11 provide useful information, but we are largely dependent on reported landings as a primary source of information. As the document correctly states, geo-referenced commercial data is not available.

Marine Mammals (3.5)

The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was cited, the caveats associated with these data (listed much later in

the descriptive section) must be emphasized when statements such as "Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed cetacean species within the SEA Area (251 sightings of 3249 individuals)". While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as DFO must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years; the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution "patterns" are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast (see Lawson and Gosselin 2009).

With respect to specific statements on cetaceans, there have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement "Bottlenose whales were observed exclusively in offshore areas..." is not ~~factually~~ correct. Also, until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area "presumably represent" components of the Scotian Shelf population. Regarding Blue whales, the statement "Blue whales were the first, observed in the SEA Area" is also incorrect as blue whales have been sighted here, but rarely. Finally, it should be included in the SEA that Sei whales have been seen close to shore in the SEA study area – two sei whales were seen observed in Placentia Bay in July.

Overall, the SEA does address seals very well. This area is an important transit area for harp and hooded seals during the winter and spring. Therefore, they are seasonally abundant and not always associated with ice. Harbour seals are common in the area.

However, hooded seals have been assessed as Not at Risk by COSEWIC while harp seals have never been assessed. This information should be corrected in Table 3.20.

Additionally, the comment that grey seals are breeding on St. Pierre and Miquelon is not accurate. There have been a number of surveys that indicate few, if any, pups are born in the area. The total population of grey seals in the NW Atlantic is approximately 300,000 (not unknown – Table 3.18). This is available in a 2006 CSAS Research Document. The number present in the area is estimated from Harms (2005), which provides estimates of abundance (that have been updated). Still, this cannot be used to estimate the total number of seals likely to be found in the area.

Species at Risk (3.7)

Fishes (3.7.1)

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

Atlantic Cod- Mention could be made of the intended reassessment of Atlantic cod by COSEWIC.

American Plaice- American plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American plaice (NL population) has a footnote "a" after NL, but the footnote is not included.

Finally, while there is much information available on spawning and life history characteristics of American plaice in Div. Subdivision 3Ps in the SEA, there is no information on plaice in Division 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

Leatherback Turtle- The large-scale aerial survey conducted in the late summer of 2007 (Lewison and Cossett 2007) provided data which allowed a more reliable estimate of leatherback turtle abundance. For the south coast of Newfoundland, survey stratum only, it was estimated that there were at least 100 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the continued, albeit, use of this area for the summer and early fall by feeding tomes, and the seasonal abundance of primary prey jellyfish, is suggestive that the Newfoundland south coast might be considered critical habitat. Consideration of other habitats will occur this week (Sept. 25, 2008), during a complete review in the federal leatherback turtle action group to promote the Leatherback Action Plan for the critical habitat designation.

The text on page 221 does not include the corrected sightings made during the 2007 aerial survey and incorporates data from other sources but the overall pattern of most leatherbacks being on the south coast of Newfoundland is still the same.

Loggerhead Turtle- There is a COSEWIC RPA process currently underway, for loggerhead turtles that although not current, data should be considered during future EAs in the SEA area.

Potentially Sensitive Areas (3.8)

Integrated Management Areas(3.8.1)

Figures representing Large Ocean Management Area (LOMA) boundaries should be included in the SEA for both NL and Maritimes Regions. In addition, LOMAs are **thousands** of square kilometres in size, not *hundreds* as stated in the SEA.

Ecologically and Biologically Significant Areas (EBSAs) (3.8.2)

It is more appropriate for this section to be titled EBSAs, AOIs, and Marine Protected Areas (MPAs) and include greater detail and discussion on the processes and implications of EBSAs.

establishing MPAs and MPA Networks. Also, six new MPAs are to be established under the Healthy Oceans (HOTO) initiative, not nine as stated in the SEA. Further information on the potential management implications of these initiatives can be obtained from the LFO Oceans Sector

Of note, Table 3.22 should include reference to being taken/modified from Templeman (2007).

Canadian Parks and Wilderness Society (CPAWS) Special Marine Areas (3.8.4)

In Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area. Also in this table, more recent information indicates that the Southeast Shoal is no longer considered nursery habitat for American Plaice as stated in the text (K. Dwyer pers. comm.)

As mentioned previously, the south coast of Newfoundland – particularly in the St. Pierre Bank area – is under consideration as critical habitat for leatherback sea turtles as a feeding area.

Exploration/Production Activities and Associated Environmental Effects (4.0):

Given available literature and environmental effects monitoring studies (which have been covered in the report) on risks associated with drilling muds, produced waters, oil spills and seismic, there would appear to be no special risk associated with oil exploration in the SEA area. Having said this, it is recognized that the purpose of a SEA is to provide a broad overview and there may be some circumscribed risk associated with a specific site – which would be accounted for (as noted in the SEA) in any specific environmental review.

The SEA identifies data gaps for biological and fisheries resources, actually in considerable detail for a SEA. Most of these data gaps are of general interest and some could apply to oil spills (from any source – shipping, fishing, etc., as well as oil development) and produced water, and probably drill cutting under very special circumstances. However, any risk associated with produced water could be considered both volume and site related, and would be covered in specific environmental assessments.

The SEA provides some major industry and agency reports which deal with the risks of water and synthetic drilling fluids. However, others can be found in the open literature (Deblois et al 2005; Mathieu et al 2005), and another major review has recently been carried out in this area by Stantec under the Environmental Studies Research Fund (National Energy Board). These reviews (which cover laboratory and field data) note the limited zone of impact of drill cuttings associated with the use of water and synthetic drilling fluids. However, regarding benthos, there are a few cases in which some degree of benthic disturbance has been noted beyond “average” disturbance zones of a few hundred meters or so (note that impact zones were both more severe and extensive in the past when diesel based drilling fluids were used).

Since both water-based and synthetic drilling fluids (as well as barite and bentonite, which are major constituents of drilling muds) have generally been shown to have little or not direct toxicity in laboratory studies (and are often classified as negligible by some agencies), the recently noted benthic disturbances could simply be indirect and related to surficial fines and associated slight anoxia (e.g. from hydrogen sulfide), or for instance altered sediment

texture. It is reasonable to note that any slight movement and deposition at fines whether caused by oil exploration activities, trawling, clamming or natural oceanographic phenomena occurring over widespread geographic areas could cause similar changes in sediment meiofauna. However, since the more recent observations at some sites of benthic disturbance have arisen as a somewhat controversial issue, it would be useful in this respect to carry out laboratory or field simulations with (a) neat surficial fines and (b) fines associated with drilling fluids to investigate the hypothesis. The question of the importance of drilling fines versus all the other sources is probably the major data gap which has arisen over the past few years on oil well drilling in relation to benthic disturbance.

Depending on site and volume, produced water can be one of the main risks associated with petroleum development. Research is ongoing in this area and some developers also have very good monitoring programs in place to provide early warning of any potential problems related to sediment and water quality (e.g. primary productivity), fish quality and fish health. However, given the large amount of available literature on this topic this section could have included more detail in the assessment. However, also as noted in the SEA, some further attention should also be given to potential effects on ichthyoplankton and zooplankton as there exists a major knowledge gap in this area.

Polycyclic aromatic hydrocarbons (PAHs) are a class of compounds of special ecotoxicological importance and are enriched in petroleum, produced waters and oil combustion residues (e.g. gas flaring). A SEA would not be expected to cover the diverse and voluminous literature in this area. However, toxicity has been associated with very low levels of PAH (e.g., Payne et al 2003; Hylland 2006), where the toxic effects can be diverse in covering biochemical, histopathological, immunological, genetic, reproductive and developmental aspects.

The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al 2007).

In Table 4.4, it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

Production Phase (4.2)

The SEA states, "All of the existing platforms offload oil to tankers for transport to the oil transshipment terminal in Placentia Bay or to markets on the east coast." Therefore, ship traffic from the east coast to Placentia Bay should be a concern for the assessment. Given that the coastal area including Placentia Bay is not considered in the SEA, ecological implications related to the spread of invasive species through such transport is overlooked in the report.

Potential Sources of Effects from Routine Activities (4.4)

The release of drilling wastes to the bottom should be addressed in this section, and references for the duration of measurable concentrations of drilling waste on the bottom need to be included.

For the purposes of the discussion on offshore drilling the many wells of White Rose are used as a worst case scenario. It would be more appropriate to use the predictions developed for the individual EAs for exploratory wells on or near the Grand Banks in this case.

Interactions and Potential Effects of Routine Activities (4.5)

The use and effects of anti-fouling agents on a offshore rig should be just also within the SEA in this section.

Effects of Sound (4.5.1)

This section appears to be very comprehensive. Much of the relevant literature has been considered. However, while this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

This discussion on sound mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long-term effects of exposure to deleterious levels of sound from these blasts.

On page 270 – there is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect must be removed.

With respect to invertebrates producing sound, American lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Effects of Drilling Muds and Cuttings (4.5.2)

Discussion of the implications of sediment movement through slumps and slides on dispersal of drilling discharges may be relevant to add to the potential effects of drilling muds and cuttings.

The disposal of drill cuttings and mud has the potential to cause a HADD, and therefore should be discussed in the section on Fish, Fish Habitat and Fisheries. The potential for taint of commercial fish should be discussed in this section.

Effects on Bottom Disturbance (4.5.3)

With respect to fish habitat, rock placement is not always an acceptable habitat compensation in the Region and comes across as implied in this section. Other areas requiring discussion in this section include the the justification for creating habitat in a potentially contaminated area (near a drilling rig); the reef effect and the attraction of fish to a potentially contaminated site; and the effects of the fisheries exclusion zone.

Effects of Produced Water (4.5.4)

The risks associated with the discharge of produced water are not solely related to hydrocarbons. The effects of nutrients, heavy metals and radioisotopes also need to be discussed.

Effects of Presence of Structures (4.5.6)

Regarding the artificial-reef-effect and related scientific evidence, it would be necessary to conduct multi-year monitoring to demonstrate potential effects, the most important component of such monitoring being pre-data. That is, a Before-After-Control-Impact Design would be required, where data would be collected (probably for 3 years) before any construction takes place, followed by additional data collection after construction is completed. Furthermore, control sites should accompany this monitoring in areas that will not be affected. This study design is currently being conducted in relation to wharf and breakwater constructions in Newfoundland to assist in the determination of EAs and [Harmful Alteration Disruption and Destruction \(HADD\)](#) implications.

To take advantage of science-based input, there should be discussions surrounding planned activities, and monitoring, long before (i.e. 3 years) construction begins. This can greatly improve mitigation measures, and is perhaps a topic pertinent to the SEA process rather than the EA process if the general impacts can be identified early on.

Effects of Marine Vessel Presence (4.5.9)

The SEA states, "There is no interaction between presence of marine vessels and the Fish VEC." This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries. The SEA is very limited in addressing each of these potentially important coastal interactions.

Accidental Hydrocarbon Releases (4.6)

Interactions and Potential Effects of Accidental Hydrocarbon Releases (4.6.4)

American Lobster- Survival of lobster larvae is very likely affected by human activities and associated pollution of the marine environment. This is particularly relevant for coastal areas. Larvae are sensitive to PAHs and heavy metal pollution. In addition, some drilling muds can be toxic to lobster larvae (Section 4.5.2). Sublethal effects of the aforementioned pollutants should be considered. Exposure to crude oil, for example, can affect lipid metabolism and molting in larvae. Sublethal concentrations of drilling fluids can affect larval respiration rate, energetics, and growth.

There is little data to investigate the possibility that the prey of leatherbacks might become contaminated. Given that leatherback turtles are known to consume anthropogenic debris, it is possible they might eat hydrocarbon products such as tar mats or tar balls, in addition to oiled jellyfish.

Cumulative Effects (5.0):

Specific effects of a single activity (e.g. drilling wastes) may be additive but the effects of several different components of a single activity or multiple activities may be synergistic. For example, sublethal hydrocarbon toxicity, nutrient loading and fishing pressure may affect fish trophodynamics and foodweb structure.

References are required to substantiate the Also, where is the evidence statement that effects added by exploration and production activities will be negligible and not measurable...? References?

Commented [T10]: Rephrase this as a statement.

Maps of existing and planned subsea cables should be included for these discussions.

Commercial, Research and Recreational Fisheries and Aquaculture (5.2)

"Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production". This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

Subsea Cables (5.7)

Maps of existing and planned subsea cables should be included in this section.

Conclusions (6.0):

Planning Implications (6.2)

Identified Potentially Sensitive Areas (6.2.1)

Sensitive areas identified in the SEA do not include DFO *Oceans Act* Marine Protected Areas (MPAs) or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, EC Environment Canada, and Parks Canada) and should therefore be considered independent of DFO's identification of EBSAs.

Addressing Data Gaps (6.4)

The SEA refers to monitoring that is specific to EAs. Where possible, it should be acknowledged that mitigation measures can be improved by early monitoring that takes place before the EA process. The SEA process may identify and enable early planning initiatives to improve mitigation measures if they can be identified. This is particularly relevant to habitat mitigation. The SEA process might recommend or identify a specific monitoring plan or process that will benefit or improve the scientific basis of future mitigation activities. This is particularly relevant to the "artificial-reef" idea, because this idea can be greatly improved upon by proper study design and collection of sufficient pre-data.

The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 30). Throughout the review it is not clear as to what is being updated and what is new.

Conclusions

- Given that the current SEA area includes, and is an extension of, the Laurentian sub-basin SEA and the Sydney Basin SEA that have been reviewed by DFO in recent years, previous SEA areas that have been addressed in recent years. Many of the comments provided by DFO Science in relation for those previous SEA reviews at earlier dates have been considered and addressed in this latest assessment, and a number of sections have been greatly enhanced with more recent information (e.g. the seismic section). In addition, the Southern Newfoundland SEA effectively acknowledges the diversity of uses surrounding potential potential exploration and production and associated activities that could occur in the Southern Newfoundland offshore area.
- However, the current Southern Newfoundland SEA still contains some similar gaps and knowledge omissions in the description of existing knowledge and analysis, and analysis present in reports preceding this. As shown, this Science Special Response has focused on these omissions and additional suggestions for improvement are provided.
- A significant shortcoming in the Southern Newfoundland SEA is the failure to address some vital coastal areas, especially Placentia Bay, that have been proven to provide important fish habitat, and that could be at increased risk of impact should the production stage include transshipment and storage of product at nearby shore-based facilities, as per the agreed scope of the SEA.
- With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and where the interactions between possible potential activities and VFCs are discussed, each is viewed independently, without potential integration. Discussion is particularly evident in the discussion and assessment of potential cumulative effects.
- Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible. Given natural variations in the state of the ocean, analyzing multi-year data sets in order to obtain some indication of the level of inter-annual variability in the area is often more appropriate than using shorter timeframes (e.g. 2006/2007) as benchmarks for assessing potential impacts, unless there is specific rationale for doing so. Many of the key physical and biological components contained in the SEA do have significant amounts of data available that should be incorporated into describing, or at least considering, trends in the assessment.

the ONLOPE Major impacts may have been adequately assessed; however, there are areas sections of the SEA that lacked sufficient detail to qualify/quantify other risks (e.g., potential impacts to vulnerable species and sensitive areas) that might require addressing at the EA stage and/or analysis at the project EA stage through a combination of identified data gaps and observations.

-
- The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program.
- Recognizing that the remit for the SEA provides a specific area for consideration, some* state items in the Science review of the SEA document may include comments relating to areas outside of the remit by reference to adjacent areas. However, in some cases it is difficult not to address species and stocks that are in close proximity to the SEA area, as DFO assesses stocks based on other boundaries that different from the SEA boundaries, allowing for some assessment areas to overlap with the SEA area. In these instances it is the intention of the review to highlight issues pertaining to areas immediately adjacent to the SEA boundary.

Commented [T12]: Conclusion

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Date: September 28, 2009

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Templeman, Nadine

From: Parsons, Jay
Sent: September-28-09 9:53 AM
To: Templeman, Nadine
Cc: Anderson, M. Robin; McCallum, Barry; Tillman, Joe; Sutton-Pande, Vanessa
Subject: RE: FOR APPROVAL- SNL SEA SSR FINAL DRAFT

Thank you Nadine. This looks good. I don't have any substantive comments to make nor any questions. It is all clear and straightforward. Thank you to you and all the reviewers for pulling this together on such short notice. Jay

-----Original Message-----

From: Templeman, Nadine
Sent: September 27, 2009 8:53 PM
To: Parsons, Jay
Cc: Anderson, M. Robin; McCallum, Barry; Tillman, Joe; Sutton-Pande, Vanessa
Subject: FOR APPROVAL- SNL SEA SSR FINAL DRAFT
Importance: High

Hi Jay,

Attached is the draft SSR from the review of the SNL SEA. While this is not the FINAL FINAL document for your approval due to this latest final draft having to be quickly circulated (Monday morning) to those who took part in the conference call Thursday evening, this version is not expected to change in either response or tone (i.e., you should not expect any significant changes for your ultimate approval).

I wanted to send this along now so you would have time to review, in case you wanted to suggest changes of your own, and due to the fact that this will require RDS approval by COB Monday (for subsequent submission to OHSAR Tuesday Sept 29).

I have cc'd Robin, Barry and Joe in case there is someone acting in your capacity for Monday.

(Either of you) let me know if you have any questions,
Thanks,
Nadine.

Templeman, Nadine

From: Worcester, Tana
Sent: September-28-09 8:38 AM
To: Templeman, Nadine
Subject: FW: Southern Newfoundland SEA s.19(1)

Hi Nadine. Here are some minor corrections from Steve with regard to the shark sections. I'm going to be at a meeting all morning, [REDACTED] I can write it up into sentences this at lunch if you would prefer.

Tana

From: Campana, Steven
Sent: Sun 27/09/2009 1:56 PM
To: Worcester, Tana
Subject: RE: Southern Newfoundland SEA

Tana: minor edits are shown in **bold**

Steve

3.2.2.11 Sharks

Six species of small dogfish are resident in Canadian waters with the spiny dogfish (*Squalus acanthius*) and black dogfish (*Centroscyllium fabricii*) being the most abundant. Other demersal sharks in Canadian waters included the smooth dogfish (*Mustelus canis*), Portuguese shark (*Centroscymnus coelolepis*), deepsea cat shark (*Apristurus profundorum*) and great lantern shark (*Etmopterus princeps*).

Spiny Dogfish

The spiny dogfish is a widely distributed boreal to warm temperate species distributed over continental and insular shelves and upper slopes of the Pacific and Atlantic oceans (Kulka 2006). Their western Atlantic distribution ranges from Labrador to Florida, with their centre of abundance located between the southern Scotian Shelf and Cape Hatteras. Spiny dogfish concentrate at bottom depth of 10 to 200 m in water ranging between 7°C to 15°C. Thus, the spiny dogfish are at the northern limit of their distribution in Newfoundland and Labrador waters. Spiny dogfish concentrate on the Western portion of the St. Pierre Bank adjacent to the Laurentian Channel and onto the Hermitage Channel in water depths of 100 to 250 m. They congregate in the warmest available water (>5°C) and the population are comprised of **both juveniles and mature** adults. Data from commercial catches observed spiny dogfish catches year-round, with the highest catches in winter and spring months (Kulka 2006). The winter catches were concentrated along the western edge of the St. Pierre Bank, which has the highest Grand Banks bottom temperatures (approximately 6°C year-round). This would indicate that a portion of the spiny dogfish distributed over the St. Pierre Bank is resident year-round and the St. Pierre Bank is a winter ground for spiny dogfish. The data suggest there is a local inshore/offshore migration pattern. The reproductive cycle of the spiny dogfish is one of the longest gestation periods for any invertebrate, making the species relatively unproductive (Campana et al. 2008). Live young are generally born after a gestation

period

of 22-24 months. Pupping grounds have not been observed in Canadian waters; however, large aggregations of mature females occur in deep warm waters off the edge of the continental shelf and in the deep basins of the central shelf throughout their range in winter. Based on the presumed birth months in the late winter, pupping occurs in these deep offshore areas. Small juveniles are seldom collected in Canadian research surveys, but those that are collected are found in the same areas as the mature females in winter. This suggests that pupping most probably occurs in Canadian waters.

3.7.1.4 Porbeagle Shark

Although not listed on Schedule 1 of *SARA*, porbeagle shark is currently listed as *endangered* under COSEWIC.

Porbeagle (*Lamna nasus*) is a large cold-water pelagic shark distributed in the western Atlantic from Greenland to

Bermuda (COSEWIC 2004b). Its distribution includes all the waters off Newfoundland. In the SEA Area, porbeagle are specifically found on the St. Pierre Bank and in the Laurentian Channel in the **spring, summer and fall**

months (Scott and Scott 1988). Mating occurs annually from September through November and live birth occurs

eight to nine months later with an average litter size of four (Jensen et al. 2002). Porbeagle has an estimated lifespan of 25 to 46 years and a generation time, the mean age of female parents, of 18 years (Campana et al. 1999; Natanson et al. 2002 in COSEWIC 2004b).

Abundance of porbeagle has declined greatly since it was targeted commercially in the 1990s after an earlier collapse and partial recovery (COSEWIC 2004b). Its life history characteristics, including late maturity and low fecundity, make this species vulnerable to overexploitation (COSEWIC 2004b). Prior to 1991, the most abundant

age-class off southern Newfoundland in the fall months was 10 to 15 years old. This is consistent with the use of

the area as a mating ground. Between 1998 and 2000, the most abundant age classes in this area were less than age 3 (Campana et al. 2002). The population size of the Northwest Atlantic population was estimated to range from 94,309 to 195,230 fish in 2005, which is approximately **10 to 24%** of the population size in the 1960s (DFO 2005b; Gibson and Campana 2005). The estimated number of mature females ranged from 9,000 to 13,000

fish, or about 15% of the population (DFO 2005b; Gibson and Campana 2005).

3.7.1.5 White Shark

Although not listed on Schedule 1 of *SARA*, white shark is currently listed as *endangered* under COSEWIC.

The

white shark is a highly migratory fish whose occurrence has been recorded over a broad depth range of surface to

1,280 m (Scott and Scott 1988). This shark is primarily a coastal and offshore inhabitant of continental and insular shelves but it also occurs off oceanic islands far from any mainland (Scott and Scott 1988). They are found rarely in Canadian waters, but have typically been seen in August and September when observed (DFO 2006e). Since 1874, a total of 34 white sharks have been recorded from eastern Canada (two since 1986) and 15 of these were captured in commercial fishing gear (e.g., gill nets, herring weirs). The species has been reported to

occur on St. Pierre Bank and in the Laurentian Channel within the SEA Area (COSEWIC 2006c). Globally, there

is a severe lack of information on abundance, distribution, and productivity of the species as well as insufficient data on bycatch, natural mortality, and reproductive rates (DFO 2006e). The recovery potential in Canadian

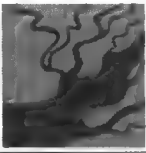
waters appears to be dependent largely on the overall recovery of the species in U.S. and other North Atlantic waters (DFO 2006e).

3.7.1.9 Shortfin Mako Shark

Although not listed on Schedule 1 of *SARA*, shortfin mako shark is currently listed as *threatened* under COSEWIC. The shortfin mako is a large temperate and tropical pelagic shark species that occurs in the Atlantic, Pacific, and Indian oceans (Campana et al. 2006). The species occur from the surface to 500 m depths and typically well offshore though it has been occasionally been observed in the littoral zone. In Canadian waters, the species is most closely associated with warm waters such as in and around the Gulf Stream. Because of this preference for warm waters these sharks are not abundant in Newfoundland waters. The species has been reported along the continental shelf waters of Nova Scotia, the Grand Banks, and into the Gulf of St. Lawrence (Templeman 1963 in Campana et al. 2006). The shortfin mako shark is highly migratory with tagging results suggesting that there is a single well-mixed population in the North Atlantic (Casey and Kohler 1992 in Campana et al. 2006). Atlantic Canada represents the northern extension of their range, and most of their population is believed to reside in more temperate waters (Campana et al. 2006). In addition, mature females and young of the year are rarely caught in Canadian waters (Campana et al. 2006).

3.7.1.11 Blue Shark

Although not listed on Schedule 1 of *SARA*, blue shark is currently listed as *special concern* under COSEWIC. The blue shark is found worldwide in temperate and tropical oceans, most often in the offshore waters between the surface and 350 m (COSEWIC 2006d). In Atlantic Canada they occur from northeastern Newfoundland southward and are regularly found in almost all waters with a peak occurrence in the late summer and fall. Mating appears to be most frequent in the spring to early summer season, **but mature females are not seen in Canadian waters..** Blue sharks have a 9-12 month gestation period and females produce litters approximately every two years. Births have been observed to occur over a wide seasonal range from spring to fall, **presumably in the eastern Atlantic.** The species is reported to consume a wide variety of prey including bony fishes, squids, birds, and marine mammal carrion. Blue shark is the most heavily fished shark species in the world and fishing is the single largest source of adult mortality.



PATH-SAPH

Text Report

Description:

Report Date:

Page 1 of 1
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Title: Southern Newfoundland Strategic Environmental Assessment
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Canada-Newfoundland & Labrador Offshore
Petroleum Board

Your File Votre référence

Our File Notre référence
BAB 3970-635

September 30, 2009

Ms. Elizabeth Young
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Canada-Newfoundland and Labrador Offshore Petroleum Board
5th Floor TD Place
140 Water Street
St. John's NL A1C 6H6

Dear Ms. Young:

Subject: Draft Southern Newfoundland Strategic Environmental Assessment (SEA)

Fisheries and Oceans Canada (DFO) has reviewed the document entitled '*Southern Newfoundland Strategic Environmental Assessment*', dated August 2009 and have the following comments.

General

Overall, the report was well written and contained comprehensive information on several aspects of the current state of the Southern Newfoundland Offshore area; however, there was limited information provided on coastal and estuarine areas, especially in the section on environmental effects. Further discussion could be provided on the potential impacts of activities (e.g. spills and discharges) conducted within the SEA on areas adjacent to the SEA.

Given the intent of a SEA is to form a basis for subsequent environmental assessment (EA) planning by providing much of the background environmental information that will be used for EA purposes and to focus on the needs for additional research where information gaps are identified, a SEA report must be held to the same standards of documentation and quality as the subsequent EAs. Often, the SEA document is referenced as the basic information for an area during an EA. Therefore, if the information in the original SEA is not correctly addressed and referenced, scientific review of subsequent documents has the potential to be cumbersome through the search for the pertinent information and/or the original statement that is being cited.

Many of the biological and ecological components of the draft SNL SEA are lacking in this required scientific rigor and documentation. Also in this respect, references are often lacking, are out of date, or improperly cited. For example, some conclusions regarding potential environmental issues and those dismissing potential environmental effects as negligible are unsubstantiated and unreferenced, while other references are cited using "as cited in" other

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reviews. With respect to the presentation of figures and tables, many of these lack sufficient detail for interpretation.

It was also noted throughout the review that this draft SEA demonstrates some similar omissions in the description of existing knowledge and analysis as those preceding it. Therefore, it is suggested that at least equal responsibility be afforded the C-NLOPB to ensure that the same omissions are not repeated in concurrent documents as that afforded by those providing expertise in reviewing this type of material.

With respect to the analysis of the information, some sections demonstrate a lack of understanding of the ecology of the system, and while individual interactions between possible projects or activities and VECs are discussed, each is viewed independently with little or no attempt at integration. This omission is particularly evident in the discussion of potential cumulative effects.

Notable in the description of the biological environment, the draft SEA often appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts (e.g., phytoplankton, zooplankton, commercial fish, and fisheries). Given natural variations in the state of the ocean, assessments of this sort should make use of broader timeframes where possible.

It was also noted throughout the review of the SEA that increased detail and consistency is required in the use of scientific names and place names. For example, 3Pn, 3Ps and 4Vs are Northwest Atlantic Fisheries Organization (NAFO) sub-divisions, not Divisions. Additionally, it should be recognized that names common to some industries are not going to be common to all (e.g. locations such as Lewis Hill, Whitbourne Canyon and Jukes Canyon and the Stone Fence). It is suggested that a map displaying all place names that are referenced within the document be included in the SEA.

Throughout the document there are various references to species being "listed" by COSEWIC (e.g. 3.2 Fish, 3.5 Marine Mammals, 3.7 Species at Risk, Table 3.20). To avoid confusion with species that have been identified in the legal list of species at risk under the *Species at Risk Act*, these statements should be rephrased as COSEWIC has "assessed" or "designated" a certain species at a certain status level. It is important to note that these "designations" carry no legal implications unless the species assessed are legally listed under SARA.

Within the species descriptions in 3.2 Fish and 3.5 Marine Mammals and other locations within the document, there are references made to certain species in the SEA area being on COSEWIC's candidate species list. This list contains species that may be assessed by COSEWIC sometime in the future. If references are being made to candidate species, then it would also be prudent to reference species in the SEA area that are on the schedule for upcoming COSEWIC assessments. Species that are scheduled for assessment would have previously been on the COSEWIC candidate list (i.e. the assessment stage is further along in the COSEWIC process than the candidate list). It should be noted that both the candidate list and the schedule of assessments change regularly and are continuously updated on the COSEWIC web site.

Specific Comments

Page xv - DFO *Department of Fisheries and Ocean's* should read "Fisheries and Oceans Canada".

Page xvi - SFAs "*salmon fishing areas or*", delete "*or*".

1.0 Introduction

Page 1 - In Section 7.2.2 of the Scoping Document, the coastline/shoreline environment is included in the detailed listing of information that will be captured within this SEA. In the fourth paragraph of this draft report, it states that "*the following specific issues are relevant for the Southern Newfoundland SEA*", including, "*Effects of oil and gas activities on the marine ecosystem from the low water mark to the offshore (4000 m depth)*". Oil and gas activities can have potential effects within the marine, coastal, and estuarine environments, which should be discussed within the SEA.

1.2 Scoping

Page 4 - The scoping document for the SEA indicates that project-environment interactions for the coastal environment will be identified and discussed. However, boundaries for the study area were chosen based on historical exploration, the 4000 m contour, and administrative boundaries, and neglected to consider that inshore areas could be impacted if the project were to reach the production stage. For example, it is recognized that ship and helicopter traffic could increase significantly in support of production and could have associated inshore effects.

2.0 Physical Environment

2.1.4 Air and Sea Temperature

Page 13 - Sea surface temperature (SST) at the first occurrence in the text or in tables/figures should be spelled out. Units should also be added to Tables 2.2 to 2.11, and Table 2.17.

2.1.8 Tropical Systems

Page 23 - In discussing tropical systems, the SEA should indicate where the Canadian Hurricane Centre (CHC) Response Zone is situated. Also for consideration, an explanation for the negative correlation between the summer North Atlantic Oscillation (NAO) index and the storm occurrence on the CHC Response Zone would be useful.

2.2.1 Currents

Page 30 - Figure 2.16 represents the main feature of the surface circulation in the western Atlantic (not just the SEA study area), but the arrow indicating flow from the Gulf of St. Lawrence does not clearly identify movement in relation to Scotian Shelf, i.e., it misses the inshore Nova Scotia current. This may not be particularly relevant to impacts within the study area, but it could be relevant to distribution of potential accidental discharges along the north-western boundary of the SEA area.

Figure 2.17 shows the bathymetry of the SEA Area, but does not cite the source of the bathymetric data. A similar omission in citation occurs in Section 7.1 of the Scoping Document where it is stated that the SEA Area extends to the 4000m contour. It should be indicated whether this information is from a commercially available dataset, from a combination of

datasets or from a Canadian Hydrographic Service (CHS) survey. Without providing the source for this bathymetric data, future assessments carried out against the information in the SEA risk the possibility of using another source of bathymetry that might not be in total conformity with that in the SEA. Also in this figure, additional labels for details such as the Laurentian Channel, Hermitage Channel, etc. in the Newfoundland Region, and for the banks in the adjacent Maritimes Region would be helpful.

Pp 29-32 - The summary on currents is incomplete with respect to ocean current variability without including the advances made in the past decade. There are studies on ocean currents associated with Gulf Stream rings for the slope area (e.g. Han 2003; Han 2004; Chaudhuri et al. 2009), where the speed can reach 1-2 m/s in Area 3P. In addition, a few of the details provided in this section of the SEA could be debated. For example, the offshore branch of the Labrador Current, particularly the surface flow, frequently does not make it around the tail of the bank – sea surface current statistics for this region from satellite altimetry that are described in various publications (e.g. Han 2004; Han 2006) to address and highlight this interannual variability of the offshore branch of the Labrador Current within the SEA.

2.2.2 Water Properties

Page 41 - The temperature pattern in Figure 2.26 does not “clearly show” the Labrador Current, but at most “suggests” its existence. If it is not the purpose of the SEA to show the two branches of the Labrador Current, the presentation of some model results (Han et al. 2008), Acoustic Doppler Current Profile (ADCP) results (Contact Dave Senciall, DFO) or calculated geostrophic currents from Conductivity, Temperature, Depth (CTD) data would be useful in relaying the appropriate information.

When available from the data, trends in the intensities of wind, waves, air temperature, sea surface temperature, visibility, and precipitation within the past 50 years should be presented within this section of the document. A discussion of storm surges should also be included in this section.

2.3.2 Sea Ice

Page 43 - Figure 2.28 shows the zonal division line occurs at about 56.1° W not 55° W as stated in the text. The figure and text need to concur. Also in this section, “Fig. 2.18” in the text should read “Fig. 2.28”.

2.3.3 Icebergs

Page 49 - Figure 2.36, illustrating iceberg drift patterns, does not match the text describing the general drift patterns. The error in drift patterns in the figure should be corrected.

2.4 Bathymetry

Page 50 - Place names and identifying features are presented only within the actual SEA area of Figure 2.37. Other areas described throughout the document within the Maritimes Region (e.g., Stone Fence) should also be identified.

2.5 Geology

Page 51 - A quality description of the geology of the area is provided, but no linkages to the implications of this information are made that can be used for the evaluation of potential project impacts (either in this section or in the planning implications).

The location of the Eastern and Western Valleys is not clear. These should be indicated by either map or latitudes and longitudes in this section.

2.7.2 Planning Implications - Physical Oceanography

Page 55 – From a planning perspective, there is no mention of the implications of the ocean currents entering the Gulf of St. Lawrence (see Section 2.2.1.1). Ocean currents in the Gulf of St. Lawrence flow in a counter-clockwise direction and winds blow onshore (predominantly northwest to southerly winds) along the southwest and west coast for much of the year. Taking into account the enclosed nature of the Gulf of St. Lawrence and the cyclonic flow of ocean currents and predominant onshore winds, there is a high probability that an accidental oil spill originating in the SEA area would reach coastal areas of western Newfoundland and perhaps throughout the Gulf of St. Lawrence.

Conclusions for planning implications based on physical oceanography need to be cautious. Currents over the slope can be much stronger than those over the Bank. The warm core ring with a significantly large current speed (1-2 m/s) may also reach quite deep (>1000m). Therefore, operating conditions could be significantly different in this slope region when compared with operations occurring over the Grand Bank in terms of possible flow-induced torque.

Other key omissions in this section include the linkages between ocean currents and spill or discharge trajectories, as well as the implications of slides and sediment movement on potential dispersal (and monitoring) of drilling discharges such as drilling muds and cuttings.

3.0 Biological Environment

3.1.2.2 Estuarine Algae

Page 59 - Eelgrass (*Zostera marina*) is noted as a species that can dominate some estuarine areas along the coast. There is no indication of the relative importance of eelgrass from a fish habitat perspective. It has recently been identified as an Ecologically Significant Species (ESS) (DFO 2009b). Since the identification of ESSs is a tool for bringing attention to species or community properties that have particularly high ecological significance in order to facilitate the provision of a greater-than-usual degree of risk aversion in the management of human activities that may affect them, eelgrass should be elaborated on accordingly within the SEA.

In the marine coastal zone, eelgrass serves as a nursery for the young of many marine finfish and invertebrate species and provides shelter from predators as well as a food supply. Evidence from Newfoundland studies suggests that the survival rate of young cod (< 1 year old) throughout their residency in eelgrass habitat may be as much as 17,000 times higher than nearby "non-eelgrass" habitats. The buffering action of eelgrass against currents, the presence of attached epiphytic algae on individual blades, as well as microbial activity associated with senescent plants all serve to increase secondary productivity, which in turn contributes food for small fish and invertebrates.

Overall, the community structure and composition of pelagic ecosystems in south coast estuaries is not adequately documented and requires elaboration. Laminaral communities on the south coast of the Island are changing rapidly at the moment due to the spread of the invasive bryozoan (*Membranipora membranacea*). The dynamics are changing from multi year kelp forests to annual recruitment of kelp and other algae. In addition to fish habitat implications that are largely unknown at this point, this ecosystem shift has consequences for oil spill sensitivity and

response. This should be considered in the SEA – possibly through the addition and incorporation of a section specifically addressing this (and other) Invasive Species.

3.1.3 Plankton

Page 59 - This section does not adequately describe planktonic communities and their ecology in terms of community composition, succession and dynamics.

Although the SEA study area has been correctly identified as an area with high concentrations of euphausiids and calanoid copepods, the report does not consider that the area represents a key overwintering area for *Calanus finmarchicus*, one of the dominant copepods in the region and a key element in the trophic transfer from phytoplankton to upper trophic levels. Head and Pepin (2007) demonstrated high concentrations of this copepod in slope waters along the southern coast of Newfoundland, extending into the Laurentian Channel during the autumn. During the period of dormancy (early autumn to late winter) the bulk of the population is found at depths ranging from 200-800 m, which may correspond to areas subject to the potential impacts of drilling mud (at depth). In the spring, this species emerges from dormancy into surface waters, where animals that have overwintered in the SEA area drift a) on the Eastern Scotian Shelf; and b) into the Southern Gulf of St. Lawrence, where they appear to represent major contributors to the regional secondary production cycle during the spring and early summer. Due to the fact that this species is a key link in food web production, there has to be some consideration of the possible impacts of toxicity downstream of the exploration sites to assess the overall consequence of various activities to productivity.

In addition, it appears that the overall state of the ocean for the region was based almost entirely on the statements from two annual reports produced for an adjacent area. More information is required since the SEA fails to provide a substantive assessment of the regional variability in the overall state of primary and secondary producers in the area of concern. In order to obtain some indication of the level of seasonal and inter-annual variability in the area, a quantification of the underlying variability in plankton abundance is required. There are several data streams from which this information could be drawn, with the longest being that obtained from the Continuous Plankton Recorder series. Although the track followed by this system is based on collections from ships-of-opportunity and may not directly transect the SEA study area, there is still considerable information that can be obtained and serve to determine seasonal cycles and inter-annual variations in standing stock of many taxonomic groups in the region. Of additional concern is that the SEA appears to be inappropriately using 2006/07 as benchmarks from which to perform an evaluation of potential impacts.

It was also noted that there is no assessment of the biodiversity of the plankton food web in this report. The SEA study area consists of an area of transition between sub-Arctic, estuarine and temperate/boreal environments. Consequently, there is a potential for a high degree of variability in the diversity observed within the region which can result in uncertainty in the evaluation of potential impacts associated with the program. Therefore, there exists a need for a thorough summary of the available information for the region and a description of the variability that has been observed to date, with careful consideration of the nature of the collections from which conclusions are derived.

More generally, since Station 27 is not located in or near the SEA area, if plankton dynamics are to be inferred from this station for the project area then the report must include a demonstration

that processes in the two areas are similar and correlated or related via the same oceanographic forcings.

Page 60 - It is not clear which groups of zooplankton the comment on diurnal migration is referring.

3.1.4 Benthic Invertebrates

Page 64 - References for benthic invertebrates are dated in the SEA. While this is often common in addressing this topic in the NL Region, it should also be noted that limited recent information may be available for consideration through unpublished benthic data (of non-commercial species) obtained during DFO RV surveys. With respect to the references that are included in this section, the document presents a reference list only – there is no related synthesis or discussion.

3.1.4.2 Slope/Abyssal

Page 67 - It is indicated that deep-sea corals provide habitat for a variety of fish species, including some that are commercial. Specific examples of the types of fish species present would provide some context to the importance/significance of corals in providing fish habitat.

Page 68 - A map indicating the CAD-NAFO Coral Protection Zone and the location of the Stone Fence in relation to the SEA area would be useful.

3.1.5 Planning Implications - Fish Habitat

Pp 68-69 - It should be noted for planning purposes that direct physical contact is not the only potential threat to corals. Increased sedimentation and toxicity resulting from drilling discharges are also a potential consideration.

3.1.6 Data Gaps - Fish Habitat

Page 69 - Several studies are cited in relation to benthic research in Newfoundland and Labrador (NL). It should be noted that many of these studies are dated, with the most recent study conducted over 20 years ago. It is recognized that limited resources are available, which should be clearly pointed out in this section.

3.2 Fish

Page 69 - The section on fish makes no mention of Snow Crab, Iceland Scallops, Sea Scallops or other invertebrate species that occur in the Maritimes Region in close proximity to the SEA area (e.g., on Banquereau Bank). Also, while it is accepted that data gaps do exist with respect to some species of fish occurring within the SEA area, more detailed information could be added in some of these species descriptions as well.

Eels should be addressed specifically in the SEA. Available data for eels was used in the COSEWIC Assessment and Status Report (2006) and shows trends over time.

3.2.1.1 Macroinvertebrates

Snow Crab

Page 70 - The statement referring to total catch per unit of effort (CPUE) for Snow Crab is incorrect. The 2008 DFO SAR which is cited states, "*CPUE changed little during 2004-2006 before decreasing in 2007*". However, the most recent DFO Science Advisory Report (SAR) (DFO 2009a) states, "*CPUE has declined since 2002, to its lowest level in 2008*". Citing DFO

(2008) is inappropriate here, and the most recent information available should be included in the SEA.

Sea Scallop

Page 70 - The reference to "Newfoundland's large offshore banks" should be removed as St. Pierre Bank has the only commercial Sea Scallop beds in the SEA Area.

Iceland Scallops

Page 71 - The SEA states '*...current abundance of mature Iceland scallops on St. Pierre Bank is less than in the 1980s and early 1990s...*', and cites Ollerhead et al. (2004), stating explicitly that the DFO data used to produce these maps did not contain data on spawning condition but rather just abundance. Therefore, the reference to '*maturity*' should be removed.

The SEA also cites Ollerhead et. al (2004) in reference to the time of spawning of Iceland Scallop on the St. Pierre Bank. However, the statement from the citation was more general in context and not as site specific as used in the text of the SEA. In fact, the original statement is "*Iceland Scallops are known to spawn in the late summer*" (citing DFO Stock Status Report C4-07. *Scallops in Quebec inshore waters.*).

Also in this section, the citation DFO 2006b, should read DFO 2006d.

American Lobster

Page 71 - This section requires additional information and clarification regarding the biennial molt-reproductive cycle. The SEA only addresses the fact that the female carries embryos under her tail for 9-12 months, and does not make mention of the fact that she broods the eggs internally for a year beforehand. This omission makes the reference to the two-year cycle confusing.

Orange-footed Sea Cucumber

Page 72 - The global distribution of this species is provided in the document, but there is no reference to its specific distribution within the SEA Area. Additional information on sea cucumber in the Atlantic Region, including Newfoundland waters, can be found in DFO (2009e) and Stansbury and Hynick (2009).

3.2.1.2 Finfish

Redfish

Page 73 - In the second paragraph, the time-series for data collection by Ollerhead et al. (2004) should read 1998-2002 not 1995-2002.

In the third paragraph, "*...and (3) Laurentian Channel – Unit 2 which includes 3Pn3Ps4Vns [June-Dec.]...*" should be replaced with "*...which includes 3Ps4Vs4Wfgj and 3Pn4Vn [June-Dec.]...*" Also, "*The importance of addressing the issue of redfish stock definition and boundaries... Fisheries Resource Conservation Council.*", is a dated statement. More recent information to address this issue can be found in DFO SAR 2008/026.

Yellowtail Flounder

Page 73 -Yellowtail Flounder in the NAFO Divisions 3LNO portion of this area are assessed using a production model. The results of this model should be reported in the SEA rather than the results of the surveys themselves. In addition, information on Yellowtail spawning has been

updated in Ollerhead et al. (2004) and should be the most recent information cited for spawning time and area for this species.

Also with respect to Yellowtail, the SEA states, "*Recent commercial catch data have indicated most catches of yellowtail..., and on St. Pierre Bank.*" However, the majority of catch of Yellowtail (about 10000 t + since 2000, except for 2006 and 2007) comes from the NAFO 3LNO area (primarily the southern Grand Bank) with typically < 90 tons from 3Ps (i.e., St. Pierre Bank). Finally, the reference stated as "(Pitt 1970 in DFO Hab Require)" is not listed in the bibliography. Please clarify.

White Hake

Page 74 – There is a minor spelling error in first paragraph: "*Cape Halteras*" should read "*Cape Hatteras*." Also, the statement "*White hake are a temperate species at the limit of their temperature range and as a result are spatially restricted to the south western Grand Banks*" is confusing and inconsistent with the previous statement that they range from Cape Hatteras to Southern Labrador. Perhaps reference to the SEA area would be helpful here.

Skates

Page 75 - Winter Skate and Barndoor Skate should be described as uncommon or even rare on the Grand Banks. Winter Skate on the Grand Bank were considered 'data deficient' by the Committee on the Status of Endangered Wildlife Species in Canada (COSEWIC), and the percentage of occurrence is very low. Barndoor Skate are currently under review by COSEWIC. With respect to Thorny Skate, the SEA initially describes their distribution as relatively continuous, but then proceeds to state that the stock had become concentrated in a small area on the southern Grand Bank. For Smooth Skate, it is not clear why two decline rates are provided (1971-2005 and 1976 to 2005). This information could be updated to at least 2008. Finally, the last paragraph on Smooth Skate may be confusing to those not familiar with Kulka et al. (2006). Instead of using the combined Designatable Unit (DU), the SEA might consider reporting on the research vessel trends in each region individually.

Pollock

Page 77 - A more recent summary of information on Pollock from NAFO Divisions 4VWX5Z is available in DFO (2009c) and Stone et al. (2009).

Greenland Halibut

Page 77 - This section is incomplete in its coverage. There is discussion about the 4RST Greenland Halibut stock (assessed by Quebec region) which is not in the SEA area, but no reference is made to the Subarea 2 + Divisions 3KLMNO stock (assessed by NAFO) since Division 3O is within the SEA area. Subdivision 3Ps, which comprises a considerable part of the SEA area, remains a separate entity (located in between) than the stocks mentioned above, where their linkages remain largely unknown.

Also, the fishery data for Greenland Halibut describes catch distribution around St. Pierre Bank, Burgeo Bank and the end of the Halibut Channel, but the SEA area encompasses portion of the NAFO management unit area for Greenland Halibut in Sub-Area 2 and Divisions 3KLMNO as well. This comment is also relevant to the Greenland Halibut description in Table 3.2 (Page 87).

Atlantic Halibut

Page 77 - The statement, "*it is known that this flatfish species, within its Canadian range, spawns between February and April at depths $\geq 1,000\text{m}$.*" does not convey an appropriate level of uncertainty. While spent and ripening Halibut have been captured in February to March in 4W, Neilson et al. (1993) found peak spawning in November and December on the Scotian Shelf and Southern Grand Banks. Sigourney et al. (2006) suggest that a shift to deeper water in the fall may be associated with spawning, while more shallow distributions in spring suggests that Halibut are already returning to summer feeding areas. Therefore, spawning depths are not known with certainty. Also, while the Gulf Atlantic Halibut Tagging Program is mentioned, the tagging program in 3NOPs4VWX5Zc is not, which may be more relevant to this assessment.

Witch Flounder

Page 78 - This section discusses only the 3Ps stock and has no information on the Witch Flounder stock that resides in Division 3O. Information on the life history/distribution of the stock in this area (Div. 3O) should be included in the SEA.

Also, the SEA states, "*These relatively non-migratory flatfish are typically found offshore, in moderately deep water (primarily in 45-275 m depth range)...*", however, Witch Flounder are found as deep as 1500m but the highest abundance is between 185 and 400m (see http://www.dfo-mpo.gc.ca/zone/underwater_sous-marin/atlantic/witch-plie-eng.htm)

Haddock

Page 79 - The SEA states "...recent surveys have not shown spawning occurring in the SEA Area...", citing Ollerhead et al. (2004). However, this is incorrect as the maps in Ollerhead et al. (2004) for the April and May distributions of spawning haddock from 1998-2002 clearly show spawning occurring within the SEA Area.

Hagfish

Page 79 - Additional information on Hagfish, including information from Newfoundland waters, can be found in DFO (2009d).

Bluefin Tuna

Page 81 - More recent information (i.e., since 2001) has been published and is available on Bluefin Tuna which should be incorporated into the assessment.

3.2.2 Non-Commercial Species

Capelin

Page 82 - While the SEA correctly states that no commercial fishery for Capelin occurs within the SNL SEA boundary, there are portions of two stocks of Capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO Capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawns at 5-8.5 °C but has been observed to spawn at 4-10 °C. On the bottom, spawning

temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

Sand Lance

Page 83 - For clarity and conciseness, suggested rewording of the section on Sand Lance is as follows: "Sand Lance is a small planktivorous fish usually found on the shallow portions of the Grand Banks in areas where bottom depths are less than 100 m and the substrate is mostly sandy. Sand Lance is a pelagic species that forms varying sized dense schools feeding throughout the water column, but also spend a portion of each day buried in the sandy seabeds. Sand Lance are found in the North Atlantic from Greenland to the Gulf of St. Lawrence." It is also important to add that Sand Lance spawn *demersally*.

Atlantic Salmon

Page 83 - Atlantic Salmon live in freshwater for the first two to five years, not two years as stated in the SEA; and Salmon may pass through the SEA area during their migration from Labrador in the spring, as opposed to the fall as stated in the SEA. Additionally, it is more appropriate to refer to Atlantic Salmon parr rather than post-smolts in the discussion on diet in this section.

It is suggested that information on Salmon management areas be expanded upon by including that "...twenty-seven scheduled salmon rivers and 82 salmon populations occur within the two SFAs with fourteen scheduled rivers occurring within the SEA area." Also, "There has not been a recent individual assessment of the stocks...in the SEA area, however, stock status is estimated from a series of index rivers."

It should also be included in this section that i) Atlantic Salmon from the endangered Inner Bay of Fundy listed stocks likely migrate through the study area; ii) there is a harvest (likely domestic) of Atlantic Salmon by the French on the Islands of St. Pierre et Miquelon, and given that St. Pierre et Miquelon has no Salmon populations this would be an inteceptory fishery on south coast stocks of this species; and iii) COSEWIC is presently reviewing the status of Atlantic Salmon.

Finally, since the fishery for Atlantic Salmon only closed in 1992 there should be some reference to historical commercial catch data in the SEA.

Sharks - Spiny Dogfish

Page 85 - The Spiny Dogfish congregate in the warmest available water (>5°C) and the population are comprised of both juveniles and mature adults.

Porbeagle Shark

Page 85 - It should be noted that the Porbeagle Shark are found in the Laurentian Channel in spring, summer and fall, and that the population size of the Northwest Atlantic population was estimated to range from 94,309 to 195,230 fish in 2005, which is approximately 10 to 24% of the population size in the 1960s.

3.2.3 Macroinvertebrate and Fish Spawning

Page 86 - The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic Cod in a spatial sense. For example, in the Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic Cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

3.2.4 DFO Research Vessel (RV) Surveys

Page 86 - The SEA describes in detail the catch results of the 2006 and 2007 DFO RV surveys within the study area. However, since this SEA is intended to serve as an assessment for potential activities over the next five years, a two year time series may be insufficient for drawing authoritative conclusions regarding abundance and/or distribution of various species having differing life-spans. This potential for error in basing conclusions on such a narrow timeframe is especially pertinent to the use of 2006/2007 RV collected in the area during those years due to incomplete survey information resulting from vessel problems there during the same timeframe. Given that this incomplete information is not used in DFO stock assessments, it would also be inappropriate for use in a SEA.

Also in this section, the SEA should provide a better description of the data used in 2006 and 2007. DFO carries out a spring survey in 3Ps, and both spring and autumn surveys in the adjacent 3O, but it is not clear whether the SEA uses both spring and autumn data for 3O.

3.2.4.1 Catch Weight

Page 86 - This section and its table (3.3) provide no merit given that the sampling trawl has different catch efficiency for various species, making comparing catch weights meaningless. An explanation of minimum and maximum mean depth and how it is calculated would also facilitate the understanding of information provided in Table 3.3.

With respect to the statement, “*They include deepwater redfish, thorny skate...*”, “deepwater” should be removed from the description of Redfish as they are not routinely separated by species during the RV surveys, except in sets where the Golden Redfish (*Sebastes marinus*) are obvious. If the DFO database was used in the assessment, it should be noted that the species code of ‘0794’ is a mixture of *Sebastes mentella* (Deepwater Redfish) and *S. fasciatus* (Acadian Redfish).

3.2.5 Planning Implications - Fish

Page 86 - The 3NO cod stock is permanently closed to directed fishing, not for ‘*several months*’ as stated in the SEA.

Page 87 - Table 3.2 in this section also requires the addition of more information for Redfish under “Timing of Spawning” - owing to their unique reproductive biology. Redfish are ovoviparous (live bearers) with mating/copulation generally occurring in the Oct-Dec. Female extrusion predominantly occurs from March-July depending on the species. Under “Eggs/Larvae” in this table, a better description on the chronology of the life history stages is available in the literature. Generally larvae are extruded at about 5mm in spring/summer, and are pelagic and free swimming until they settle on bottom at about 30mm.

Also with respect to American Lobster, Table 3.2 makes explicit reference to mating, but not spawning, in the “Timing of Spawning” column. This should be corrected to reference spawning

explicitly, and should be consistent with the species biology information in section 3.2.1.1. In the "Depth Distribution of Eggs/Larvae" column, "*Larvae have a 6-10 pelagic stage*" should read, "*Larvae have a 6-10 week pelagic stage*"

3.3 Fisheries

It is not clear from the descriptions of fisheries whether a fishery for a particular species is targeted or not, i.e., it is not clear whether landings are the result of a directed fishery or bycatch in a fishery. It is also difficult to evaluate the accuracy of landings from the Maritimes Region as presented, and since not all landings are georeferenced, maps may be an under-representation.

3.3.1.1 Commercial Fisheries Overview – Landed Value

Page 104 - There are a few minor concerns with respect to the landings and landed value of commercial fisheries within the SEA area. Specifically, the catch weights in Tables 3.6 and 3.7 appear overstated in some instances. For example:

- NL yellowtail flounder catches in 2007 were 3,716t compared to a total of 4,789 stated for the SEA area;
- NL whelk catches in 2007 were 3,977t compared to a total of 9,711 stated for the SEA area; and
- Cod catches by NL vessels in the SEA area would be much below the 12,894 stated for the SEA area.

It should be noted that in all instances above, DFO's Policy and Economics Branch have determined that catches in the area by other DFO Regions would not be sufficient to make up those differences. Therefore, the data or methodology utilized in preparing the aforementioned tables should be reassessed to ensure that it provides a reasonable representation of the commercial activity in the area.

Page 115 - The explanation as to how landed values are derived is confusing and needs clarification.

Page 116 - A brief description of the different type of licenses discussed in the section on 'Fishing Enterprises and Licenses' should have been included.

3.3.1 Commercial Fisheries

Yellowtail Flounder

Page 123 - Landings values in Figure 3.30 are low for 2006. It should be mentioned in the text why the value is unusually low (i.e., industry restructuring).

American Plaice

Page 133 - Landings values in Figure 3.45 differ from values in the text. It is possible that the figure is describing American Plaice harvest in Div. 30 only, while the text is describing another area. These discrepancies should be fixed. Otherwise, the SEA should be explicit in its interpretation of the information being used. In addition, consideration of industry restructuring is also pertinent to the use of 2006 by-catch landings values for American Plaice.

Greenland Halibut

Page 137 - It appears that the SEA does not include any statistics from NAFO member states fishing Greenland Halibut within the portion of Division 3O within the NAFO Regulatory Area (i.e. Outside 200mi).

Hagfish

Page 139 - Landings values indicated in the SEA (Fig. 3.54 and the text) are inconsistent with those used in the assessment of Hagfish that was reported in the DFO SAR in May 2009. Also, the 2006 SAR indicates landings of about 340 t (over 700 t is suggested from Fig. 3.54), and the 2007 SAR indicates landings of about 300 t (about 980 t is suggested from Fig. 3.54).

Sea Scallop

Page 146 - Landings values of average harvest of Sea Scallop differs between Table 3.4 and the text on page 146 (i.e., 1867.4 t in the table is not equal to 280 t in the text). Figure 3.65 also does not reflect the value in the text. Finally, the values in Figure 3.65 differ from those found on the Quota Reports provided by DFO, Commercial Statistical Services and DFO 2007/006.

3.3.3 Recreational Fisheries

Capelin

Page 151 - Recreationally, Capelin are not harvested using seines and traps as these are commercial gear types that require a commercial license for a specific fishing area.

3.3.6 Data Gaps - Fisheries

Page 153 - It should be noted both at the beginning of commercial fisheries and data gaps sections, that catches outside the 200-mile limit by foreign vessels are not included in the descriptions provided in this SEA. This information on reported catch is available at NAFO at the scale of Division/subdivision but not geo-referenced nor by sub-units.

3.5 Marine Mammals

Page 189 - The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was cited, the caveats associated with these data (listed much later in the descriptive section) must be emphasized when statements such as "*Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed cetacean species within the SEA Area (251 sightings of 3249 individuals)*". While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as this must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years; the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution "patterns" are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO in 2007 – during which extra effort was expended on the province's south coast (see Lawson and Gosselin 2009).

Page 197 - With respect to specific statements on cetaceans, there have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement "*Bottlenose whales were observed exclusively in offshore areas...*" is incorrect. Also, until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area "...presumably represent components of the Scotian Shelf population."

The statement "*Blue whales were frequently observed in the SEA Area.*" is also incorrect as blue whales have been sighted here, but rarely.

3.5.5.2 Grey Seal

Page 204 - The comment that grey seals are breeding on St. Pierre and Miquelon is not accurate. There have been a number of surveys that indicate few, if any; pups are born in the area. The total population of grey seals in the NW Atlantic is approximately 300,000 (not unknown – Table 3.16). This is available in a 2008 CSAS Research Document. The number present in the area is estimated from Hammill (2005) which provides estimates of abundance (that have been updated). Still, this cannot be used to estimate the total number of seals likely to be found in the area.

3.6.1 Loggerhead Turtle

Page 205 - There is a COSEWIC Recovery Potential Assessment process currently underway for loggerhead sea turtle that, although not currently available, should be considered during future EAs in the SEA area.

While the general biological details presented in the SEA for the various SARA fish species are relatively accurate, in nearly every case the data is outdated by at least two years and needs to be updated as best possible.

3.7 Species at Risk

Page 206 - The COSEWIC internet address provided is the French version and although this still links correctly to the web site, it would be more appropriate to use the English link in the English document – www.cosewic.gc.ca.

Page 207 - Note that there are additional recovery documents which have been recently published and should be referred to in the SEA. There is a recovery strategy (final) for the North Atlantic Right Whale dated June 2009 and a proposed recovery strategy for the Blue Whale (dated August 2009). These are available on the SARA Public Registry (www.sararegistry.gc.ca).

Page 208 - Hooded Seals have been assessed as 'Not at Risk' by COSEWIC while Harp Seals have never been assessed. This information should be corrected in Table 3.20

3.7.1.1 Wolffishes

Page 210 – In the first paragraph, there is no reference provided for population estimates of northern and spotted wolffish. It also indicates that “*wolffish numbers have been increasing within the SEA area*” without providing any reference.

In the fourth paragraph, an unpublished COSEWIC report is referenced; however, it should be noted that 2001 COSEWIC status reports for the Northern and Spotted Wolffish are published on the SARA Public Registry.

3.7.1.2 Banded Killifish

Page 210 - There are actually ten known sites of Banded Killifish, rather than seven. DFO has an updated factsheet available for public distribution.

3.7.1.3 Atlantic Cod

Page 211 – Although the document mentions that the Laurentian North population of Atlantic Cod includes St. Pierre Bank and Northern Gulf of St. Lawrence cod, it fails to describe the important migration of cod (as well as other demersal species) that takes place between these two areas. Cod in the Northern Gulf of St. Lawrence and along the south coast of Newfoundland comprise an assemblage of stocks within which there is considerable mixing. They are currently at low levels as a group and overall have declined by about 80% over the past thirty years.

3.7.1.10 American Plaice

Page 213 - American Plaice have been found at depths up to almost 1400 m (Morgan and Bowering 2006) not up to 713 m as stated in the SEA. Also, in Table 3.20, American Plaice (NL population) has a footnote “a” after NL, but the footnote is not included.

While there is much information available on spawning and life history characteristics of American Plaice in Subdivision 3Ps in the SEA, there is no information on plaice in Division 3O. This should be corrected; especially since there is minimal intermingling of adult fish.

3.7.1.11 Blue Shark

Page 214 - Mating appears to be most frequent in the spring to early summer season, but mature females are not seen in Canadian waters. Also, births have been observed to occur over a wide seasonal range from spring to fall, presumably in the eastern Atlantic.

3.7.4.1 Leatherback Turtle

Page 220 - The large-scale aerial survey conducted in the late summer of 2007 (Lawson and Gosselin, 2009) provided information which allowed a minimal estimate of leatherback turtle abundance. For the south coast of Newfoundland survey stratum only, it was estimated that there were at least 700 leatherback turtles present. This estimate will increase when corrections are made for sighting biases. The large number of leatherback turtles in this area, together with the consistent long-term use of this area in the summer and early fall by feeding turtles, and the seasonal abundance of primary turtle prey (jellyfish), is suggestive that the Newfoundland south coast might be considered important habitat.

3.7.5 Planning Implications – Species at Risk

Page 221 – Although this section mentions listed species are subject to mitigations in the Geophysical, Geological and Geotechnical Program Guidelines, it should also reference DFO’s

Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment.

Page 222 - The second paragraph needs more clarification with regards to the definition of critical habitat as per the provincial *Endangered Species Act*. The definition for critical habitat under the *SARA* is different and should be incorporated as well.

The last paragraph states that "*operators should monitor SARA issues through...CAPP, the law gazettes, the internet and through communication with DFO and Environment Canada, and should adaptively manage any issues that may arise in the future*". Please identify the mechanisms which may be used (e.g. regular meetings, etc.).

3.8.1 Integrated Management Areas

Page 223 - Please replace the 1st paragraph with the following, "*The SEA Area includes a large area in the Placentia Bay Grand Banks (PBGB) LOMA, overlaps and is adjacent to a portion of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative Area, and as well, borders the Gulf of St. Lawrence Integrated Management (GOSLIM) Area at the most southerly point within the Cabot Strait. These Integrated Management bodies and processes are important from a planning perspective.*"

Figures representing Large Ocean Management Area (LOMA) boundaries should be included in the SEA for both NL and Maritimes Regions. In addition, LOMAs are **thousands** of square kilometres in size, not *hundreds* as stated in the SEA.

3.8.1.3 Gulf of St. Lawrence Integrated Management (GOSLIM) Initiative

Page 224 - The Southern Newfoundland SEA borders the GOSLIM LOMA boundary at the most southerly point within the Cabot Strait (NAFO 4R boundary), which encompasses the West Coast of Newfoundland EBSA (10) and the Bay St. George/Port au Port Peninsula Coastal Management Area.

Two major concerns from a GOSLIM perspective involve the impacts on migratory marine species that utilize the area of the proposed SEA; and interaction between oil and gas operations and the physical elements of the marine area within the Cabot Strait.

From a physical perspective, the Labrador Current generally moves westward along the south coast of the Island of Newfoundland and then northward into the Gulf of St. Lawrence. Winds are predominantly westerly, blowing onshore from the west/southwest during the summer months and west/northwest for much of the winter. Ice cover along the southern most portion of the West Coast is minimal (<60 days) (AMEC Earth and Environmental Limited, 2001. Biophysical Overview of Western Newfoundland and Southern Labrador).

CMA: It is suggested that this section include information on the Bay St. George/Port au Port Peninsula Coastal Management Area, as follows: "*The Bay St. George/Port au Port Peninsula Coastal Management Area encompasses St. George's Bay, an important spring and fall spawning/feeding area for Atlantic herring and migration/staging area for Atlantic salmon. The lobster fishery is also a significant economic driver for communities in the area. The Grand Codroy Estuary is an important staging/nesting area for migrating waterfowl and shorebirds including the endangered Piping plover*".

General information on GOSLIM EBSAs: Atlantic cod, redfish and other marine species use the Esquiman Channel including the Cabot Strait escarpment as a principal migration corridor. Dense concentrations of Atlantic cod are known to overwinter in NAFO Area 3PN (within the Southern Newfoundland SEA), migrating along the Esquiman Channel and northern GSL in the spring to spawn and returning in the fall (DFO, 2006. Ecologically and Biologically Significant Areas (EBSA) in the Estuary and Gulf of St. Lawrence: identification and characterization. DFO Can. Sci. Advis. Sec., Sci. Adv.Rep. 2007/016).

Given the compounding effect of ocean currents, winds and lack of ice cover; there is increased potential for a spill to impact on coastal and marine habitat and species along Western Newfoundland. In this regard, data gaps concerning the impacts of various stages of operation on migratory species should be addressed.

3.8.2 EBSAs

Page 224 - It is more appropriate for this section to be titled EBSAs and Marine Protected Areas (MPAs) and include greater detail and discussion on the processes and implications of EBSAs, MPAs and MPA Networks. It is stated that there will be nine new MPA's created. It should be clarified that the **nine** new MPAs consist of **six** *Oceans Act* MPAs and the other **three** are Parks Canada and Environment Canada initiatives. Further information on the potential management implications of these initiatives can be obtained from the DFO Oceans Sector (<http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm>).

DFO NL Region has identified 11 EBSA's within the Placentia Bay Grand Banks LOMA. These areas will be important for further conservation planning and when given further consideration, may need some additional level of protection.

Page 225 - There is mention of the West Coast of Newfoundland EBSA immediately adjacent to the SEA area and a reference given (DFO 2007f). It should be noted that while it has not yet been published on the DFO CSAS website, further documentation exists which describes conservation priorities within the West Coast of Newfoundland EBSA. The manuscript document may be obtained by contacting Gerald Chaput, DFO Moncton (506) 851-2022 or Gerald.Chaput@dfo-mpo.gc.ca.

It should also be noted that DFO Maritimes Region is also putting forth a series of Areas of Interest (AOIs) for potential designation similar to the NL Region. Some of these AOIs border on the SEA area as depicted in the Figure 1. The C-NLOPB should be aware of the following information regarding the Maritimes progress.

In 2009, a subset of these areas will undergo public consultation to choose one AOI to become a MPA under the *Oceans Act*. While only one of these areas will become an AOI in the short term, the mapping of ecological priority areas will serve as the foundation for a MPA network in the region. This initiative builds on the work to identify EBSAs in the region, but uses a more data-driven approach. The sites are referred to as: 1) Sydney Bight, 2) St Anns Bank, 3) North of Canso Bank, 4) Misaine Bank and Eastern Shoal, 5) Middle Bank, 6) the Gully Trough, 7) Shortland and Haldimand Canyons and Slope, and 8) the Northern Spur.

The three study areas adjacent to and/or partially within the Southern Newfoundland SEA area are St. Anns Bank, Misaine Bank and Eastern Shoal, and Shortland and Haldimand Canyons and Slope.

Misaine Bank & Eastern Shoal

Misaine Bank is unique compared to other banks on the Scotian Shelf because its surface was carved into deep channels by glaciers more than 10,000 years ago. This study area includes parts of Artimon Bank, the Laurentian Channel, and the Eastern Shoal on Banquereau. These features provide important habitat for many different fishes and other animals, including redfish, snow crab, skates, sculpins, and shrimp. Fragile and long-lived deep sea corals and sponges have also been found in several parts of the area. The area is important habitat to several at-risk or depleted species, including winter skate, Atlantic cod, and two species of wolffish. Many species of fish and whales migrate through this area, especially along the shelf edge into the Laurentian Channel, where they feed on krill and other prey.

St Anns Bank

This area includes St Anns Bank, Scatarie Bank, and a portion of the Laurentian Channel. Many species migrate through the St Anns Bank study area including fishes like herring and bluefin tuna and the endangered blue whale, along with other whales, porpoises, and dolphins. Endangered leatherback turtles feed in this area during the late summer and early fall. Atlantic cod from the Gulf of St Lawrence, which are currently at very low numbers, use parts of this area in the winter when shallower Gulf waters are too cold. The area is also important habitat for Atlantic wolffish. Finally, corals and sponges can be found in the deeper parts of the area.

Shortland and Haldimand Canyons and Slope

This area of the Scotian Shelf Slope features Shortland Canyon and Haldimand Canyon, both of which are known to be important habitat for the endangered Northern bottlenose whale and support significant concentrations of large branching cold-water corals. This slope area consistently shows a high biodiversity relative to other parts of the Scotian Shelf, and provides important habitat to a number of species including halibut, thorny skate, and redfish. Finally, the Stone Fence, one of the most important areas to corals in the region, is found in this area, at the "corner" where the Laurentian Channel turns into the shelf slope. The only records of living *Lophelia pertusa*, a reef-forming deep-water coral, in the Maritimes are from this area. This prompted the creation of the Lophelia Coral Conservation Area in 2004, which restricts all bottom fisheries for the protection of corals.

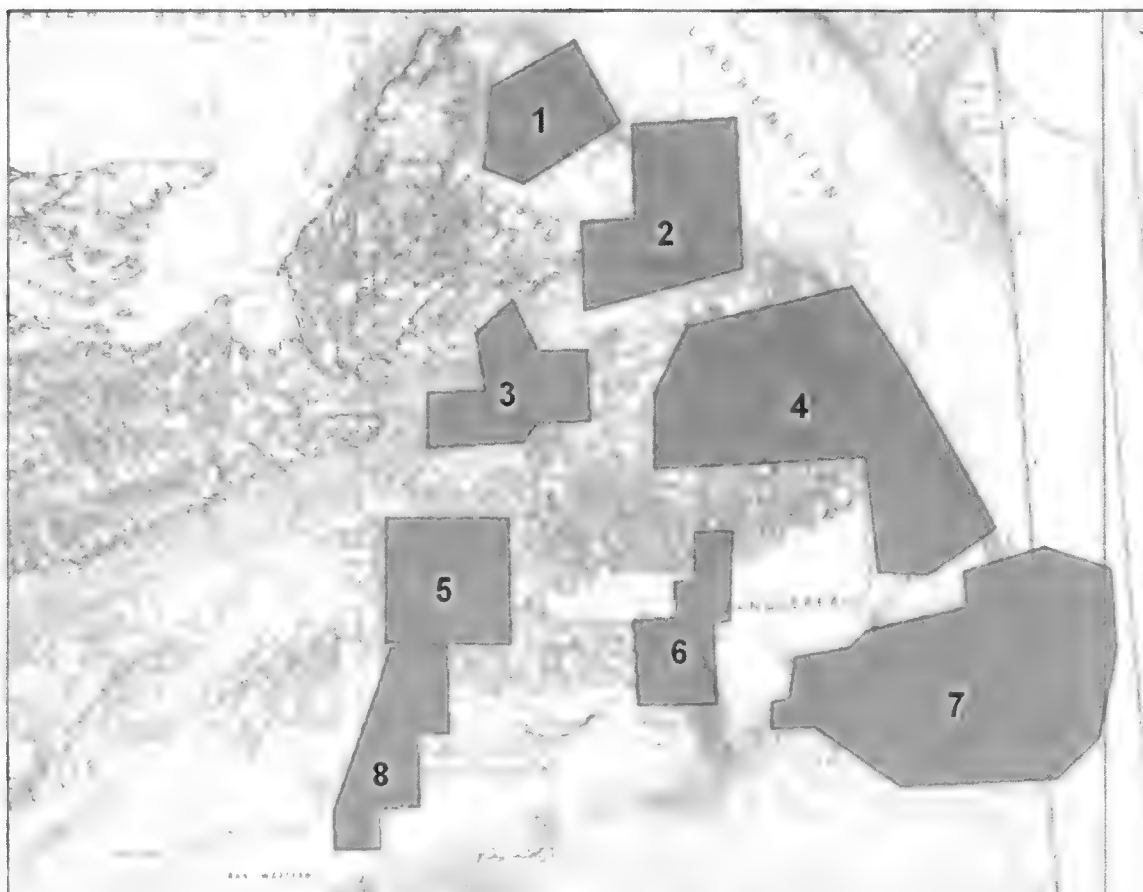


Figure 1 Map of Study Areas

Pp 226-8 - Table 3.22 should include reference to being taken/modified from Templeman (2007).

3.8.4 CPAWS Special Marine Areas

Page 230 - This section could be improved by including a map of the Special Marine Areas identified with respect to the SEA Study area and the National Marine Conservation Areas.

Pp 230-232 - Table 3.24, it should be noted that Penguin Islands is also the site of an American lobster reserve/closed area. Also in this table, more recent information indicates that the Southeast Shoal is no longer considered nursery habitat for American Plaice as stated in the text (K. Dwyer, pers. comm.).

3.8.7 Planning Implications – Potentially Sensitive Areas

Page 233 - The potential implications of the presence of EBSAs within and adjacent to the SEA area should be discussed within this section. EBSAs have been identified by DFO Science for LOMA planning initiatives. These identifications do not necessarily mean restrictive conservation or management measures, but proponents should be aware that scientific and planning work is ongoing and EBSAs will be an important tool for further conservation planning (i.e., potential use for identifying future marine protected areas for MPA network planning, and developing integrated management objectives to support sustainable oceans management planning).

4.0 Exploration/Production Activities and Associated Environmental Effects

4.1.2.1 Potential Issues

Page 239 - Benthos could also be smothered as a result of drill mud and cuttings and should therefore be identified as a potential issue related to routine exploration activities.

4.3 Decommissioning Phase

Page 241 - In cases where explosives will be used in the abandonment of wells, a proponent must also follow DFO's Guidelines for the Use of Explosives in Canadian Fisheries Waters and any regulations applicable at the time of abandonment.

4.4.4.3 Production Sounds

Page 247 - Although it is recognized that there are differences between each platform operating in the offshore environment, it would be useful to provide data from current platforms in the Newfoundland offshore in order to put the following statement in context "*a typical FPSO constructed from a ship's hull may be noisier than an anchored semi-submersible...*".

4.4.7 Production Effluents and Emissions

Page 252 - Although the exact quantities of produced water for a given development are not known, estimates would be useful.

4.5 Interactions and Potential Effects of Routine Activities

Page 254 - In Table 4.4, it should be noted that produced water (as it might influence water turbidity or jellyfish body composition through uptake) and industrial light sources (as it effects turtle and jellyfish behaviour) might be considered as possible sources of interaction with the leatherback VEC.

The use and effects of antifouling agents such as paints (on and offshore) should be discussed in this section.

4.5.1 Effects of Sound

Page 255 - While this section includes discussion on zooplankton and benthic invertebrates it does not specifically mention corals, an important and sometimes fragile component of fish habitat.

Page 263 - With respect to invertebrates producing sound, American Lobsters also produce sounds. A reference to related research for *Homarus* species on this topic would be useful to include since *Panulirus* species, mentioned in the text, are not found in NL waters.

Page 264 - This discussion on sound mentions the lack of behavioural responses by humpback whales to industrial blasting activities. But, the study also suggested that the increased local humpback entrapment rate may have been influenced by the long-term effects of exposure to deleterious levels of sound from these blasts.

Page 270 - There is no evidence to assume that hearing plays no part in leatherback turtle navigation, so the statement to this effect should be removed.

4.5.1.8 Planning Implications – Effects of Sound

Page 272, Bullet 9 - Note that the standards set out in DFO's Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment are minimum standards.

4.5.1.9 Data Gaps – Effects of Sound

Page 272 - The data gap described for seismic is reasonable with the added understanding that it is premature at this time to adopt sound pressure guidelines for fish and shellfish without some knowledge of dose-response relationships for exposure. Also the issue of chronic seismic exposure under conditions of a 2-3 week survey is a major knowledge gap for which no information is available, for any species. Injury zones may not exist to any major extent for fish and shellfish but representative studies are needed if only for assurance. This is supported by recent sublethal effect observations including disturbances on blood parameters, feeding and alteration in gene expression (Payne et al 2007; Andrews et al 2007).

4.5.2 Effects of Drilling Muds and Cuttings

pp. 272-274 – There is no mention of critical habitat for *SARA* listed species within this section. It should be acknowledged that critical habitat would be considered pending the potential for any future identification (for example the smothering of habitat associated with drilling muds could be an issue if critical habitat is identified). Also, when considering potential effects on endangered or threatened *SARA* species, individuals need to be considered as well since harm to individuals of endangered or threatened *SARA* listed species is prohibited according to the Act.

4.5.2.1 Fish, Fish Habitat and Fisheries

Page 273 – The spatial and temporal limitations of the deposition of drilling muds/fluids/cuttings need to be confirmed within project specific EAs through modeling and sampling. It will be important to ensure that the EAs of specific projects undertaken within the SEA area include detailed descriptions of the benthic and pelagic (fish and invertebrates) communities which may be impacted directly by drilling-related activities such as the smothering of habitat and suspension of drilling muds/fluids/cuttings within the pelagic zones adjacent to project features.

Further, the SEA states that deposition of drilling muds and cuttings could affect the benthos a few hundred metres around an exploratory well. This could be potentially significant if it occurs in a sensitive area, or in shallower waters where wave action could result in greater mixing, thereby having a greater effect on the coastal zone. Consideration should be given to this situation accordingly.

4.5.3.1 Bottom Disturbance - Fish, Fish Habitat and Fisheries

Page 274 – The potential increase in habitat diversity and noted positive effects on fish VECs should be supported by reference to appropriate scientific or environmental assessment literature. The stated positive effects of bottom disturbance (e.g. construction of rock berms) are likely species-specific and care should be taken to avoid generalized statements concerning positive effects for all fish species. Any positive effects would have to be weighed against the negative effects resulting from habitat alteration or destruction.

The last sentence of the first paragraph should be replaced with "In fact, strategic placement of rock of varying sizes yielding various dimensions of interstitial spaces is an accepted marine habitat compensation approach in NL waters".

pp. 274-275 - See previous comment re: SARA species and critical habitat.

4.5.3.4 Planning Implications – Effect of Bottom Disturbance

Page 275, 2nd mitigation – Fish Habitat Compensation is required to satisfy the No Net Loss guiding principle of DFO's Policy for the Management of Fish Habitat and is often included as a condition of a Subsection 35(2) *Fisheries Act* Authorization which is required for the harmful alteration, disruption or destruction of fish and fish habitat.

4.5.3.5 Data Gaps – Effect of Bottom Disturbance

Page 275 – Determining whether a HADD of fish habitat is likely to occur, quantifying this HADD and negotiating appropriate fish habitat compensation, is required by DFO prior to issuing a Subsection 35(2) *Fisheries Act* authorization. The Habitat Protection Division (HPD) of DFO in the NL Region has developed a draft Habitat Classification/Quantification System which is currently being used to classify and quantify marine habitat in Newfoundland and Labrador. The Department also uses a national practitioner's guide to apply fair and consistent decisions on compensation matters across Canada; however, habitat compensation is considered an adaptive process which may change on a project-by-project basis as new information becomes available through project monitoring and additional research.

4.5.4 Effects of Produced Water

pp. 275-276 - This section indicates that effects of produced water will not likely being significant to the populations of marine animals, but if endangered or threatened SARA species are involved, then potential effects on individuals should be considered. The risks associated with the discharge of produced water are not solely related to hydrocarbons. The effects of nutrients, heavy metals and radioisotopes also need to be discussed.

It is also mentioned that there is potential for produced water to affect water quality and plankton. This could have potential effects for certain species such as marine mammals. For example, within the Blue Whale Recovery Strategy food availability and contamination are listed as anthropogenic threats.

4.5.6.1 Effects of Presence of Structures - Fish, Fish Habitat and Fisheries

Page 277, 2nd para – Literature should be cited which supports the statement that the artificial reef effect will have a positive effect on all fish habitat components. Furthermore, if the intention is to remove the colonized animals from the structures, then it can not be considered a positive effect. It also mentions the potential for the structures to attract marine mammals and sea turtles. Further assessment is required to determine whether this could lead to an increase in the likelihood of collisions with vessels (because of increased vessel traffic), particularly marine mammals. Other species may also be sensitive to contamination and attracted to these areas containing drilling muds, produced water and other liquid and solid wastes, etc.

Also, there is no mention within this section of the potential for future identification of critical habitat for species at risk and the implications associated with placement of structures.

4.5.6.5 Planning Implications - Effects of Presence of Structures

Page 279 – This section should also include a requirement for a monitoring program to be initiated prior to the installation of any structures such that baseline condition can be established. This information can then be used to accurately quantify actual benefits of the artificial reef effects.

4.5.9 Effects of Marine Vessel Presence

Page 281 - The SEA states, "*There is no interaction between presence of marine vessels and the Fish VEC.*" This statement may be true only because the report does not consider coastal areas. For example, Placentia Bay currently has a variety of invasive species that can be transported by marine vessels to and from the area. The effects of invasive species on VECs can target various species of fish, fish habitat, and fisheries.

4.6.1 Blowouts and Spills

Page 283 - The utility of referencing the US National Academy of Science (NAS 2000) by stating 28,000 wells drilled and 10 billion barrels of oil produced, resulting in 751 bbl lost into the marine environment, does not add anything to the assessment. Especially in light of the fact NL offshore oil industries have done an infinitesimal amount of exploration and production in comparison, resulting in at least a 1000 bbls lost at Terra Nova on November 22, 2004.

4.6.3 Fate and Behavior

Page 284 - Absent from this section is mention of the extremely high energy environment encountered off the coast of Newfoundland, particularly in the winter months. Past experience indicates this factor alone has more impact on the final fate of the spilled than any man lead effort.

Page 285 - The numbers of reports that have been recorded by Coast Guard Environmental Response are different than that presented in the table. There have been more unexplained sheens in the area immediately around the offshore oil platforms, some of which are not associated with releases but with deck washings, etc.

4.6.4.3 Fisheries

Page 287 - There is little data to investigate the possibility that the prey of leatherbacks might become contaminated. Given that leatherback turtles are known to consume anthropogenic debris, it is possible they might eat hydrocarbon products such as tar mats or tar balls, in addition to oiled jellyfish.

Page 289 - The report states that it is only possible to quantify the effects of an oil spill after a spill has occurred. An example should be provided of a recent spill such as the Spanish *Prestige* to give some indication of potential economic impacts.

4.6.4.8 Planning Implications – Accidental Hydrocarbon Releases

Page 291 - The content within this section is very general. It would be more beneficial to include a spill scenario and working through the logistics of responding and supporting the efforts to mitigate the spill's effects.

The SEA discusses the use of dispersants and *in-situ* burning as if they were regular response actions. There is a requirement for pre-approval from Environment Canada before either of these response actions could be taken. Currently there is no means of applying the dispersants that are stored at CG and there is no 'fire boom' located in NL.

In situ burning has been attempted off the Coast of Newfoundland; however the success of this strategy is largely dependent on specialized equipment, operator expertise and a government

permitting process. The timeline for *in situ* burning in a spill response is very small off the coast of Newfoundland.

Mechanical containment and recovery, historically, has been the main line of defence for releases in NL waters. The current maximum weather conditions for effective and efficient containment and recovery is in the range of "beaufort 4". This is the limit that the Response Organizations have to plan to respond. Larger, more robust equipment (booms and skimmers) are available in other parts of the world that can be deployed and is effective, in much higher weather conditions. The standards should be increased for operators in this environment and the response equipment should be dedicated to each operator.

5.0 Cumulative Effects

Page 294, 2nd para – The SEA presents the most recent information regarding the state of the oil and gas industry in Newfoundland. References up to 2008-9 should be provided. The historical analysis makes references to a 2005 SEA that considered a 2002 analysis of oil discoveries in the Newfoundland and Labrador offshore area. This should be updated to reflect current information even if no new discoveries have been made.

References are required to substantiate the statement that effects added by exploration and production activities will be negligible and not measurable.

5.2 Commercial, Research and Recreational Fisheries and Aquaculture

Page 295 - *"Some parts of the SEA Area undergo intensive fishing activity, so much so that the environmental effects of trawling on benthos and fish, the effects of longlines and gillnets on fish populations, seabirds, sea turtles, and marine mammals greatly exceed any potential effects from oil and gas exploration and production"*. This statement is not substantiated and is speculation. Some aspects of it may be true but none of it has been substantiated in the document.

5.7 Subsea Cables

Page 298 - Maps of existing and planned subsea cables should be included in this section.

5.5 Tourism

Page 298, 5th para – Data is presented for the 2004-2005 cruise ship industry. Recent data should also be included.

6.0 Conclusion

6.2.1 Identified Potentially Sensitive Areas

Page 299 - Sensitive areas identified in the SEA do not include DFO *Oceans Act* MPAs or MPA Networks specifically. These MPAs should be considered in addition to LOMA's or EBSAs since Canada has both domestic and international commitments to create MPAs and MPA networks in support of ecosystem-based and integrated management. This process will often integrate various federal departmental mandates (i.e., DFO, Environment Canada, and Parks Canada) and should therefore be considered independent of DFO's identification of EBSAs.

6.4 Addressing Data Gaps

Page 299 - The SEA also includes of a combination of updates for existing SEA areas (Sydney Basin and Laurentian sub-basin) and a new area (similar to NAFO Div. 30). Throughout the review it is not clear as to what is being updated and what is new.

6.2.3 Mitigations

Page 300 – Mitigations should also be included for production activities as it is a potential outcome of successful exploratory drilling.

Appendix 1 (Page A-1)

Issues and Concerns

5th paragraph under Fisheries and Oceans

It indicates the area has been identified as being ecologically important for one or more various reasons (possible reasons should be included, which are listed in CSAS Research Document 2007/052 – Placentia Bay-Grand Banks Large Ocean Management Area Ecologically and Biologically Significant Areas).

7th paragraph

Replace the word “*technical*” from the following statement with ecological “...and the application of technical and feasibility”

8th paragraph

“*DFO will work with...*” should be changed to “*DFO Oceans will work with Fisheries and Aquaculture Management, Science, the Province, and stakeholders to identify...*”

The objective of a MPA is to conserve and protect the *important aspects* of marine ecosystems (remove ecological integrity).

The personal communication attributed to Geoff Coughlan; July 2009... was in fact collaboration from DFO Oceans and should not be attributed to this individual directly.

Sources of information

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Thank you for providing DFO the opportunity to comment on this SEA document. If you have any questions or comments regarding the above, please contact Sara Lewis, Senior Biologist, Marine Habitat Section by phone at 772-4140 or by e-mail (sara.lewis@dfo-mpo.gc.ca).

Yours truly,



Carole Grant

Section Head – Marine Habitat

Habitat Protection Division

Oceans, Habitat and Species at Risk Branch

sl

Templeman, Nadine

From: Lewis, Sara J
Sent: October-01-09 1:23 PM
To: Templeman, Nadine
Subject: RE: Information required
Attachments: SNL SEA letter to CNLOPB final.DOC

the letter.

From: Templeman, Nadine
Sent: Wednesday, September 30, 2009 5:14 PM
To: Lewis, Sara J
Subject: RE: Information required s.19(1)

Hi Sara,

I hope these are of some help to you. I will give you a call on Thursday to discuss further.

Nadine.

From: Lewis, Sara J
Sent: Wed 30/09/2009 3:03 PM
To: Templeman, Nadine
Subject: Information required

Hi Nadine,
Here are the pieces of information that could be useful to give to the CNLOPB. If we are commenting that they need more references, we should be able to back that up!

Please call so we can discuss. I need to send the document today, so I'm going to send as is, but I'd like to provide this information if at all possible.

Sara

3.1.4 Benthic Invertebrates

Page 64 - References for benthic invertebrates are dated in the SEA. While this is often common in addressing this topic in the NL Region, it should also be noted that limited recent information may be available for consideration through unpublished benthic data (of non-commercial species) obtained during DFO RV surveys. With respect to the references that are included in this section, the document presents a reference list only – there is no related synthesis or discussion.

This information can be obtained through a formal request to DFO for this information through ATIP.

How can the RV surveys be obtained if unpubl?

Bluefin Tuna

Page 81 - More recent information (i.e., since 2001) has been published and is available on Bluefin Tuna which should be incorporated into the assessment.

For example... Neilson, J.D. 2009. Available Information for Preparation of the Western Atlantic Bluefin Tuna (*Thunnus thynnus*) COSEWIC Status Report. DFO CSAS Res. Doc. 2009/ 035. 19 pp. http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2009/2009_035_e.pdf

(and references contained therein)

3.3.3 Recreational Fisheries

Brook Trout

The anadromous form of brook trout are not referenced in text. The recreational fishery for brook trout is at least as valuable as the recreational Atlantic Salmon fishery.

Can figures back this up? This is likely in reference to the cultural value of the fishery, and therefore, figures would not be used to represent this.

3.5 Marine Mammals

Page 189 - The data range for the DFO sightings database as of January 2009 is 1864-2009, with many sightings dating from the early 1940's based on whaling station records.

While the DFO database was cited, the caveats associated with these data (listed much later in the descriptive section) must be emphasized when statements such as "*Of the cetacean sightings identified to species, long-finned pilot whales were the most frequently observed cetacean species within the SEA Area (251 sightings of 3249 individuals)*". While this is true for the DFO sightings data for this area as a whole, these pilot whale sightings were made primarily a number of decades ago, prior to the collapse of the squid stocks around Newfoundland. Overall summaries of broad databases such as this must be avoided or done cautiously as annual, seasonal, and geographic variations in marine mammal presence could be masked. **In this particular case, DFO has evidence that pilot whales are not the most frequently observed cetacean species in nearshore areas in recent years;** the 2005 LGL marine mammal monitoring programme, which sighted a high proportion of pilot whales, occurred in offshore waters for the most part.

DFO has evidence, but can the public access this too?

Contact Jack Lawson with respect to this statement and whether or not this evidence is published or not. I believe the point was that caveats of using this type of observation database should be recognized and stated up front (statement in paragraph below).

Similar issues arise from data condensation when the authors discuss distribution patterns for marine mammals. Most distribution "patterns" are mainly a function of effort, rather than a true representation based on systematic surveys. This point must be made in the discussion of these data early in this section of the SEA.

For abundance values, there are recent minimum estimates (which are currently being updated to account for sightings biases) for some cetaceans in Newfoundland based on a large-scale aerial survey conducted by DFO

in 2007 – during which extra effort was expended on the province’s south coast (see Lawson and Gosselin 2009).

Page 197 - With respect to specific statements on cetaceans, there have been several live strandings of northern bottlenose whales on the south coast of Newfoundland in recent years, as well as occasionally sightings by DFO and others. Thus the statement “*Bottlenose whales were observed exclusively in offshore areas...*” is incorrect. Also, until more information is available, it is not safe to conclude that northern bottlenose whales sighted in the SEA area “...presumably represent components of the Scotian Shelf population.”

The statement “*Blue whales were frequently observed in the SEA Area.*” is also incorrect as blue whales have been sighted here, but rarely. Finally, it should be included in the SEA that Sei whales have been seen close to shore in the SEA study area – two sei whales were observed in Placentia Bay in July.

Where is this information to? What is considered frequent based on the numbers from Table 3.17.

Jack Lawson (pers. comm.) can be used for the updated information provided in the SEA review. These were more comments on updated information and suggestion as how to interpret the data, respectively for the paragraphs. This is not unusual when the data being used is observation (and therefore also effort) based and compiled over such a long timeframe.

3.7.1.11 Blue Shark

Page 214 - Mating appears to be most frequent in the spring to early summer season, but mature females are not seen in Canadian waters. Also, births have been observed to occur over a wide seasonal range from spring to fall, presumably in the eastern Atlantic.

Reference? References were not provided from this reviewer (Maritimes), however, it is likely that the information can be found either directly or cited within the references below.

Campana, S.E., L. Marks, W. Joyce and N.E. Kohler. 2006. Effects of recreational and commercial fishing on blue sharks (*Prionace glauca*) in Atlantic Canada, with inferences on the North Atlantic population. Can. J. Fish. Aquat. Sci. 63:670-682. [Download paper in .pdf format](#)

Campana SE, Marks L, Joyce W, Kohler N (2005) Catch, bycatch and indices of population status of blue shark (*Prionace glauca*) in the Canadian Atlantic. Col. Vol. Sci. Pap. ICCAT 58: 891-934..[Download paper in .pdf format](#)

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Sara Lewis

Senior Biologist | Biologiste
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**Pages 519 to / à 546
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sont des duplicatas des
pages 487 to / à 514**

Templeman, Nadine

From: Lewis, Sara J
Sent: October-08-09 2:10 PM
To: Templeman, Nadine
Subject: FW: Southern NL SEA - Comments on draft Scoping document

-----Original Message-----

From: Meade, James
Sent: Monday, January 19, 2009 1:13 PM
To: 'Coady, Kim'
Cc: Coughlan, Geoff; Grant, Carole
Subject: RE: Southern NL SEA - Comments on draft Scoping document

Hi Kim,
Here are DFO comments re: draft Scoping document for the Southern NL SEA.

Pg. 4, Figure 1 should be updated to provide more information. It should include the NAFO areas/ divisions, identify the exploration licences and holders of same (key), and identify the "French Corridor."

Pg. 5, Edit objective 4 to: "Describe and evaluate potential environmental effects associated with offshore oil and gas exploration AND PRODUCTION activities" based on the following statement on page 1: "This document describes the scope of a SEA for offshore petroleum exploration AND PRODUCTION related activities in the marine area south of the island of Newfoundland." The description and evaluation can be fairly general considering the text at the bottom of page 2 and top of page 3 re: the difficulty in predicting the nature and scale of production activities. Also, the last paragraph in section 7.0 (pg.6) states production will be addressed generically.

Pg. 6. Spatial Boundary. There should be another figure/ map that illustrates the boundaries of the LSB and Sydney Basin SEAs showing overlap as well as the new area to the east for this (Southern NL) SEA.

Pg 6. The text regarding the SEA area should discuss the method for determining the spatial boundary (eg. 4000m contour chosen for southern boundary, administrative boundaries of NAFO divisions 3P and 3O and NS-NL Laurentian Channel Boundary).

Pg. 7. Bullet 5 should also include marine-based tourism.

Pg. 8. There should be some descriptive text regarding unexploded ordinances as it is unclear what should be expected from a review of this.

Pg. 9. Commercial fish species and Recreational fish species should be replaced with Commercial Fisheries and Recreational Fisheries.

Pg. 11. Sensitive/ Special Areas should also list corals as well as Ecologically and Biologically Significant Areas (EBSA) identified through the Placentia Bay/Grand Banks Integrated Management initiative .

Cheers,

Jim

s.19(1)

-----Original Message-----

From: Coady, Kim [mailto:KCoady@cnlopb.nl.ca]

Sent: Monday, January 19, 2009 11:20 AM

To: [REDACTED] Francine Mercier; Fred Allen;

Coughlan, Geoff; Glenn Troke; [REDACTED] Meade, James; [REDACTED]

[REDACTED] Young, Elizabeth

Subject: Southern NL SEA - Comments on draft Scoping document

Just a reminder that comments are due this week (preferably by mid-week) for the draft Southern NL SEA scoping document.

Can you send me a quick email indicating when you will be submitting your comments.

Thanks

Kim Coady
Environmental Assessment Officer
Canada-Newfoundland and Labrador Offshore Petroleum Board

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Templeman, Nadine

From: Templeman, Nadine
Sent: October-08-09 3:08 PM
To: Templeman, Nadine; Mansour, Atef; Sutton-Pande, Vanessa
Subject: RE: DFO Review of Southern Newfoundland Strategic Environmental Assessment
Attachments: FW: Southern NL SEA - Comments on draft Scoping document

Folks,

In speaking with Sara on the phone just now, she provided me with the answers (below) to the questions I posed from our meeting today. They would like to send comment back through the CNLOPB to provide to LGL (as it is the CNLOPB that is the proponent and not LGL) within the next couple of weeks. Atef has expressed that he would like to meet with Habitat before we provide our responses to the LGL questions from Sara. Therefore, I suggest that we try to set up a meeting between Habitat and ourselves in the next week or so. I think it would be useful to reconsider the responses that I drafted today before going this meeting so we have something to work from (just a suggestion). Let me know what you think~

DFO reviewed the Scoping document - not Science (attached). Primary draft - is reviewed by Habitat to make sure all necessary sections are included only. Second draft - for review and comment by the public and the working group/board. Final draft - will go to the working group (includes DFO Habitat and other GOs and NGOs) to make sure the attached table of concordance created from the first review is acceptable. The last several SEAs reviews included comments at the same stage as this one (2nd draft)

Legislatively, it is believed that we are not required to review any of these SEA documents due to the fact that there is no specific project being proposed that could have effects on fish and/or fish habitat, and therefore, does not fall under the authority of the *Fisheries Act*. However, Sara is going to check the CEAA cabinet directive to verify this.

The SEAs are well referenced in the EAs, and therefore should have the most accurate and up to date information contained therein. DFO Habitat feels that this was a common understanding between those on the board and the CNLOPB, but that LGL might have thought that simply combining the previous two SEAs (Laurentian and Sydney Basins) and extending the information into the Southern Grand Bank is what was required or what would suffice for this SEA.

From: Templeman, Nadine
Sent: Thursday, October 08, 2009 1:28 PM
To: Lewis, Sara J
Cc: Grant, Carole; Sutton-Pande, Vanessa; Mansour, Atef
Subject: RE: DFO Review of Southern Newfoundland Strategic Environmental Assessment

Hi Sara,

Myself, Vanessa, and Atef met this morning on the concerns below. In anticipation of providing you with a response (much of which we have already discussed), we have a couple of questions of clarification for you as well in order to help us make sure we are on the right track and not overlooking anything in our response.

- Was the Scoping Document reviewed by DFO Habitat and/or Science? If so, by who, when, and how? Do you have a copy of this response?
- Legislatively, which documents are required to be reviewed by DFO? Scoping? Drafts? Finals? All?
- What is the answer to Question #4? I.e., What is the primary role of the SEA, and therefore, what level of information is required to fulfill this role? Is there a difference in the what CEAA requires, what is presented in the scoping document, and the terms under which LGL is contracted to compile the document?

Although we will be waiting to have a more formal discussion with you on this after we receive comments back from CNLOPB, we can move forward with addressing some of these other concerns in the meantime.

Thanks in advance, and let me know if there are any questions,
Nadine.

From: Lewis, Sara J
Sent: Wednesday, October 07, 2009 4:12 PM
To: Templeman, Nadine
Cc: Grant, Carole
Subject: FW: DFO Review of Southern Newfoundland Strategic Environmental Assessment

Hi Nadine,
I received this from LGL today. It has been decided that we (Habitat) would like to go back to the CNLOPB and cc LGL with a DFO-wide response since my letter was that as well. So I wondered if you would be able to comment on any points that Bob brings up. We are looking into at what point the CNLOPB was informed about the process, but we would like to give you the opportunity to respond. There are some things, like the last point that are an easy response, i.e. it was well known at the outset that this was a public process.

If you have any questions, please give me a call.
Thanks,
Sara

From: Robert Buchanan [mailto:]
Sent: Wednesday, October 07, 2009 11:33 AM
To: Lewis, Sara J
Cc: 'Young, Elizabeth';
Subject: DFO Review of Southern Newfoundland Strategic Environmental Assessment

s.19(1)

Sara

This e-mail is to express LGL's concern in regard to DFO's review of the Southern Newfoundland SEA. This concern revolves around four main points:

1. The DFO response was formulated on a preliminary draft of the SEA. It is unclear to us why DFO did not provide some of these comments during the scoping of the SEA, or at least after a final draft. This is a prime concern because the DFO comments are (or will be) published.
2. LGL is specifically named in the response but given no opportunity for rebuttal. This is a prime concern because the tone of some of the responses is accusatory and seems to suggest that LGL does not know the subject matter. [I assure you that this is not the case. LGL has been writing EAs for NF waters for over 30 years and LGL writers are typically experienced M.Sc. or Ph.D. level biologists.]
3. While it is certainly very useful to have the input of 21 DFO scientists who are presumably experts in their various disciplines, some of them have no experience with the offshore industry, the issues, or EA. Some of the comments involve the internal minutiae of stock assessment, much of which is not particularly relevant to an SEA, and much of which may not be immediately available to consultants. [For example, many of the references quoted appeared after the SEA draft was written.]
4. There seems to be confusion amongst all parties surrounding the whole SEA process and what its objectives are.

Again, we appreciate DFO's constructive comments and the ones that correct any errors. However, we do not appreciate a DFO process which was in the public arena and unknown to us at the outset of the SEA process.

Best regards,

Robert Buchanan, M.Sc.

VP Atlantic

LGL Limited

environmental research associates

**Pages 552 to / à 553
are duplicates of
sont des duplicatas des
pages 547 to / à 548**

Templeman, Nadine

From: Lewis, Sara J
Sent: October-09-09 11:13 AM
To: Templeman, Nadine
Cc: Grant, Carole
Subject: RE: DFO Review of Southern Newfoundland Strategic Environmental Assessment
Attachments: FW: Southern NL SEA - Comments on draft Scoping document

Hi Nadine,

To follow up from our conversation yesterday, I thought it would better to have response in writing to your questions.

a. DFO Habitat typically reviews scoping documents and did so for this project. I believe that we would involve Science at that stage only if there was a glaring question about a particular issue, but in general it not regular practice. We would go to you with the subsequent assessment documents. Jim Meade reviewed the Scoping document in January of this year, along with Geoff Coughlan in Oceans (they were both members of the Working Group for the SN SEA, now it is myself and Melissa Abbott). Their comments are attached.

b. Legislatively, DFO is not required to review any documents. The Cabinet Directive for SEAs (http://www.ceaa-acee.gc.ca/Content/B/3/1/B3186435-E3D0-4671-8F23-2042A82D3F8F/CEAA-StrategicFinal_e.pdf) does not specifically mention DFO in any context. It does state that "*Departments and agencies are encouraged to develop their own sources of information and analytical tools such as ...expert advice from other branches within departments and other federal departments...*" which would be CNLOPB asking us as experts. This is CNLOPB's initiative and therefore they have the directive to conduct the work as they have always been the Lead regulatory agency on all Oil and Gas projects in Nfld. They are using it for planning and determining if they should let out more exploration licences in the area. Jim commented on the scoping document as mentioned, and he checked Draft 1 to ensure that all parts were in the document, without doing a thorough review of the entire SEA. This is Draft 2, you know the story on that. Next steps will be Draft 3 with a table of concordance which only the Working Group receives in about 6 weeks time and then the Final.

c. The Answer to Question 4, from the Scoping Document: Strategic environmental assessment is defined as "the systematic and comprehensive process of evaluating the environmental effects of a policy plan or program, and its alternatives" (Government of Canada Cabinet Directive, 1999). SEA incorporates a broad-based approach to environmental assessment that examines the environmental effects which may be associated with a plan, program or policy proposal and that allows for the incorporation of environmental considerations at the earliest stages of program planning.

Typically, The SEA has been used as a background document to base future EAs in that specific area. It provides "a broader-scale EA that considers the larger ecological setting, rather than a project-specific EA that focuses on site-specific issues with defined boundaries" (Scoping document). There have been SEAs done in five locations throughout Newfoundland, with the mandate to revisit every 5 years to ensure the most up-to-date information exists. For example, updates on Sensitive Areas is something CNLOPB are currently concerned about and are pushing for better detailed information on the location of them within and directly adjacent to the Study Area. Depending on the levels of activity in the SN region, this document may become a heavily reference document in future EAs. I think that LGL feels that the SEAs are getting alot bigger in scope and the EAs are still required to put in alot of information as well, there is no break. CEAA doesn't require any certain things in the SEA because this is taken upon by the CNLOPB as a planning tool. There is no specific project (physical work or activity) yet which enacts conditions of CEAA. You have a copy of the Scoping Document which indicates the requirements and I've attached the RFP for your information. http://www.cnlopb.nl.ca/pdfs/snsea/snsea_rfp.pdf The terms under which LGL was contracted is beyond my scope and would be a Board question if you need that information.

I hope that helps. Please let me know if something is still unclear.

Sara

From: Templeman, Nadine
Sent: Thursday, October 08, 2009 1:28 PM
To: Lewis, Sara J
Cc: Grant, Carole; Sutton-Pande, Vanessa; Mansour, Atef
Subject: RE: DFO Review of Southern Newfoundland Strategic Environmental Assessment

Hi Sara,
Myself, Vanessa, and Atef met this morning on the concerns below. In anticipation of providing you with a response (much of which we have already discussed), we have a couple of questions of clarification for you as well in order to help us make sure we are on the right track and not overlooking anything in our response.

- Was the Scoping Document reviewed by DFO Habitat and/or Science? If so, by who, when, and how? Do you have a copy of this response?
- Legislatively, which documents are required to be reviewed by DFO? Scoping? Drafts? Finals? All?
- What is the answer to Question #4? I.e., What is the primary role of the SEA, and therefore, what level of information is required to fulfill this role? Is there a difference in the what CEAA requires, what is presented in the scoping document, and the terms under which LGL is contracted to compile the document?

Although we will be waiting to have a more formal discussion with you on this after we receive comments back from CNLOPB, we can move forward with addressing some of these other concerns in the meantime.

Thanks in advance, and let me know if there are any questions,
Nadine.

From: Lewis, Sara J
Sent: Wednesday, October 07, 2009 4:12 PM
To: Templeman, Nadine
Cc: Grant, Carole
Subject: FW: DFO Review of Southern Newfoundland Strategic Environmental Assessment

Hi Nadine,
I received this from LGL today. It has been decided that we (Habitat) would like to go back to the CNLOPB and cc LGL with a DFO-wide response since my letter was that as well. So I wondered if you would be able to comment on any points that Bob brings up. We are looking into at what point the CNLOPB was informed about the process, but we would like to give you the opportunity to respond. There are some things, like the last point that are an easy response, i.e. it was well known at the outset that this was a public process.

If you have any questions, please give me a call.
Thanks,
Sara

From: Robert Buchanan [mailto: [REDACTED]]
Sent: Wednesday, October 07, 2009 11:33 AM
To: Lewis, Sara J
Cc: 'Young, Elizabeth'; [REDACTED]
Subject: DFO Review of Southern Newfoundland Strategic Environmental Assessment

s.19(1)

Sara

This e-mail is to express LGL's concern in regard to DFO's review of the Southern Newfoundland SEA. This concern revolves around four main points:

1. The DFO response was formulated on a preliminary draft of the SEA. It is unclear to us why DFO did not provide some of these comments during the scoping of the SEA, or at least after a final draft. This is a prime concern because the DFO comments are (or will be) published.
2. LGL is specifically named in the response but given no opportunity for rebuttal. This is a prime concern because the tone of some of the responses is accusatory and seems to suggest that LGL does not know the subject matter. [I assure you that this is not the case. LGL has been writing EAs for NF waters for over 30 years and LGL writers are typically experienced M.Sc. or Ph.D. level biologists.]
3. While it is certainly very useful to have the input of 21 DFO scientists who are presumably experts in their various disciplines, some of them have no experience with the offshore industry, the issues, or EA. Some of the comments involve the internal minutiae of stock assessment, much of which is not particularly relevant to an SEA, and much of which may not be immediately available to consultants. [For example, many of the references quoted appeared after the SEA draft was written.]
4. There seems to be confusion amongst all parties surrounding the whole SEA process and what its objectives are.

Again, we appreciate DFO's constructive comments and the ones that correct any errors. However, we do not appreciate a DFO process which was in the public arena and unknown to us at the outset of the SEA process.

Best regards,

Robert Buchanan, M.Sc.
VP Atlantic
LGL Limited
environmental research associates

Templeman, Nadine

From: Lewis, Sara J
Sent: November-04-09 2:01 PM
To: 'Young, Elizabeth'
Cc: Grant, Carole; Templeman, Nadine; Sutton-Pande, Vanessa; Mansour, Atef
Subject: DFO Review of Southern Newfoundland Strategic Environmental Assessment

Elizabeth,

As you may know, LGL has sent DFO comments based on our response to the Draft 2 Southern Newfoundland SEA. We have considered these comments and have provided the following response for your review. As the CNLOPB is the proponent, we have sent the response to you for you to use as you deem fit. If you have any questions, please don't hesitate to call at 772-4140.

Thanks,
Sara

Sara Lewis

Senior Biologist - Marine Section | Biologiste - Section de l'habitat marin
Habitat Protection Division | Division de la protection d'habitat
Oceans, Habitat & Species at Risk Branch | Direction des océans, de l'habitat et des espèces en péril
Fisheries and Oceans Canada | Pêches et Océans Canada
Northwest Atlantic Fisheries Centre | Centre des Pêches de l'Atlantique Nord-Ouest
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PO Box 5667 | CP 5667
St. John's NL A1C 5X1 Canada
Email: Sara.Lewis@dfo-mpo.gc.ca
Telephone | Téléphone: (709) 772-4140/Fax | Télécopieur: (709) 772-5562
Government of Canada | Gouvernement du Canada

1. The DFO response was formulated on a preliminary draft of the SEA. It is unclear to us why DFO did not provide some of these comments during the scoping of the SEA, or at least after a final draft. This is a prime concern because the DFO comments are (or will be) published.

DFO Habitat Management (HM) commented on the scoping document and the 1st DRAFT of the SEA to ensure that all required components were addressed within the scope. Historically, it is the 2nd DRAFT of the SEA document that is released for Public comment, and this is the same draft version that DFO has provided written comments back to C-NLOPB on previous SEAs. It is at this point that HM staff requested comments from Science Branch on components of their expertise, so it was this document that was scientifically peer reviewed.

The newer peer review process by which DFO Science provides comments to HM, that is eventually published, is in accordance with the Government of Canada SAGE (Science Advice for Government Effectiveness) Guidelines (2000), which include Transparency and Openness. The Departmental approach to standardizing this advice is through the Canadian Science Advisory Secretariat (CSAS), which coordinates the peer review of scientific issues for DFO (http://www.dfo-mpo.gc.ca/csas/Csas/Home-Accueil_e.htm). All documents that result from such processes are public documents and are available on the aforementioned website.

With regard to the publishing of DFO's comments, any outgoing correspondence provided to the C-NLOPB is accessible to the public via the Access to Information and Privacy Act (<http://www.tbs-sct.gc.ca/atip-aiptp/index-eng.asp>). Furthermore, the C-NLOPB posts all Regulatory Authorities' comments on their website for projects that have undergone an environmental assessment (EA) pursuant to the Canadian Environmental Assessment Act (CEAA).

2. LGL is specifically named in the response but given no opportunity for rebuttal. This is a prime concern because the tone of some of the responses is accusatory and seems to suggest that LGL does not know the subject matter. [I assure you that this is not the case. LGL has been writing EAs for NF waters for over 30 years and LGL writers are typically experienced M.Sc. or Ph.D. level

biologists.]

LGL is simply named, appropriately during the Context of the Science Advisory Report (SAR), as the author of the SEA. The review of the SEA is provided to the C-NLOPB in response to their request for comments on the content of the document they have received from LGL through a third party service agreement. It is the responsibility of DFO to ensure that decisions related to petroleum exploration and production and potential impacts on the marine environment are made using the most accurate and current information. It is not the intent of the review process to be accusatory in nature – therefore, it would be appreciated if the areas of perceived accusations within the SAR be highlighted as to recognize the sensitivities of reviewing this type of material through a DFO Science Advisory Process in the future and to deal with this issue on hand, if DFO determines it is applicable.

3. While it is certainly very useful to have the input of 21 DFO scientists who are presumably experts in their various disciplines, some of them have no experience with the offshore industry, the issues, or EA. Some of the comments involve the internal minutiae of stock assessment, much of which is not particularly relevant to an SEA, and much of which may not be immediately available to consultants. [For example, many of the references quoted appeared after the SEA draft was written.]

Scientists are asked to review sections of the SEA related to their areas of expertise. While their experience may not be directly linked to the offshore industry, their expertise does often include significant knowledge of potential human impacts to fish and fish habitat - many of which include biological, physical, and chemical impacts that could result from various industries, but through common pathways.

With respect to comments related to stock assessment, these generally involved the correction or standardization of the SEA interpretation of the data referenced. Additionally, it is recognized that raw data requested from DFO RV surveys has the potential to be misinterpreted without other background information (i.e., incomplete surveys, timing, etc.), however, it is not the responsibility of DFO Science to presume how this data will be interpreted and for what end use. It is the responsibility of the end-user of this data to be aware of, and communicate if required during its use, its associated caveats and/or limitations.

Further evaluation of the Terms of carrying out this type of Science review, especially with respect to providing updated information, may be required by DFO to address the fact that the C-NLOPB requested that updated references be identified where available, but that the author feels this is inappropriate or unfair. In the meantime, Science has agreed to remove all references to information that may not be immediately available to consultants within the main text of the SAR, but in the recognition of its added value to the proponent and future activities that will proceed the final draft of the SEA, add these references to an additional section in the SAR (e.g., Other/Upcoming considerations or the like) that will recognize both the timeline issues and their potential value.

4. There seems to be confusion amongst all parties surrounding the whole SEA process and what its objectives are.

Typically, the SEA has been used as a background document upon which to base future EAs in that specific area. It provides "a broader-scale EA that considers the larger ecological setting, rather than a project-specific EA that focuses on site-specific issues with defined boundaries" (SNL SEA Scoping document). It is expected that the objectives of the SEA process are the same as those outlined by the Canadian Environmental Assessment Agency and, more specifically to the matter at hand, the Request for Proposal (RFP) for the Southern Newfoundland SEA, as well as the associated Scoping Document. It is DFO's understanding that the SEA should provide the most current, up-to-date information for the study region, with the intent to use the document as a reference for subsequent EAs within the SEA project area. This information is to be updated every five years to ensure accuracy as well as the inclusion of any new information such as SARA listings and COSEWIC designations or sensitive areas. The EA document would then provide site-specific and updated relevant information as required, with a summary of the fundamental facts as provided in the SEA.

In the meantime, information surrounding the CSAS processes, policies, and guidelines – under which the Science Review of the SNL SEA was carried out – can be found at http://www.dfo-mpo.gc.ca/csas/csas/Process-Processus/Process-Processus_e.htm.

s.19(1)

From: Robert Buchanan [mailto:]
Sent: Wednesday, October 07, 2009 11:33 AM
To: Lewis, Sara J
Cc: 'Young, Elizabeth';
Subject: DFO Review of Southern Newfoundland Strategic Environmental Assessment

Sara

This e-mail is to express LGL's concern in regard to DFO's review of the Southern Newfoundland SEA. This concern revolves around four main points:

1. The DFO response was formulated on a preliminary draft of the SEA. It is unclear to us why DFO did not provide some of these comments during the scoping of the SEA, or at least after a final draft. This is a prime concern because the DFO comments are (or will be) published.
2. LGL is specifically named in the response but given no opportunity for rebuttal. This is a prime concern because the tone of some of the responses is accusatory and seems to suggest that LGL does not know the subject matter. [I assure you that this is not the case. LGL has been writing EAs for NF waters for over 30 years and LGL writers are typically experienced M.Sc. or Ph.D. level biologists.]
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4. There seems to be confusion amongst all parties surrounding the whole SEA process and what its objectives are.

Again, we appreciate DFO's constructive comments and the ones that correct any errors. However, we do not appreciate a DFO process which was in the public arena and unknown to us at the outset of the SEA process.

Best regards,

Robert Buchanan, M.Sc.

VP Atlantic

LGL Limited

environmental research associates

Templeman, Nadine

From: Morris, Corey
Sent: December-08-09 11:47 AM
To: Templeman, Nadine
Cc: Bratney, John
Subject: RE: Reference available?

Hi Nadine.

John Bratney suggested that the second reference probably came from the COSWIC cod report, from 2003 potentially. It might of came from a more recent draft which is not yet finished as far as I know.

As for the halibut channel quote, I can't think of published references for that specific cod spawning aggregation. I guess it is an information gap. However, it is generally known that Atlantic cod form dense overwintering aggregations and this behaviour is an important life history attribute. My personal knowledge of cod in halibut channel during the winter, during the past few years at least, is based on unpublished catch and effort information. I guess if someone wanted to, they could compare fishing areas, timing, and catch rates to validate - I think commercial data would be particularly valuable in this case.

Corey

Corey Morris
Science Branch / Branche de Science
Fisheries and Oceans Canada / Pêches et Océans Canada
P.O.Box 5667
St.John's, NL Canada A1C 5X1
Telephone / Téléphone:: (709) 772-6676
E-mail / Courriel électronique:: Corey.Morris@dfo-mpo.gc.ca

From: Templeman, Nadine
Sent: Monday, December 07, 2009 11:05 AM
To: Morris, Corey; Healey, Brian; Bratney, John; Power, Don
Cc: Lewis, Sara J; Mansour, Atef
Subject: FW: Reference available?

Hi folks,

s.21(1)(b)

Would you be able to assist Sara with a reference that pertains to the statements below?

Corey, I think the first statement came directly from you during the SEA review. I am not sure where in Groundfish the second one came from off-hand, but I do know that there should be quite a bit of information available on this

.could we help them out on this?

Much appreciated,
Nadine.

From: Lewis, Sara J
Sent: Fri 04/12/2009 9:58 AM
To: Templeman, Nadine
Subject: Reference available?

Hi Nadine,

Do you know who had these comments from the Southern Nfld SEA? Is there anyway of getting the references?

Please let me know how to deal with this.

Sara

Biological Environment, Macroinvertebrate and Fish Spawning - Page 86 - The SEA does not specifically address the importance of known pre-spawning and spawning aggregation behavior of Atlantic Cod in a spatial sense. For example, in the Halibut Channel, cod form dense spawning aggregations in late winter and spring, and is consistent from year to year. It is likely that other areas representative of similar behaviors for this species occur as well. Since Atlantic Cod are potentially vulnerable while aggregated an effort should be made to identify locations of fish aggregations during critical life history processes such as spawning.

Response D-55

Unable to incorporate the suggested information because no references were provided by DFO reviewer.

Biological Environment, Species at Risk, Atlantic Cod - Page 211 – Although the document mentions that the Laurentian North population of Atlantic Cod includes St. Pierre Bank and Northern Gulf of St. Lawrence cod, it fails to describe the important migration of cod (as well as other demersal species) that takes place between these two areas. Cod in the Northern Gulf of St. Lawrence and along the south coast of Newfoundland comprise an assemblage of stocks within which there is considerable mixing. They are currently at low levels as a group and overall have declined by about 80% over the past thirty years.

Response D-83

Unable to incorporate new information because no references were provided by DFO reviewer.

Sara Lewis

Senior Biologist - Marine Section | Biologiste - Section de l'habitat marin
Habitat Protection Division | Division de la protection d'habitat
Oceans, Habitat & Species at Risk Branch | Direction des océans, de l'habitat et des espèces en péril
Fisheries and Oceans Canada | Pêches et Océans Canada
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Government of Canada | Gouvernement du Canada

Templeman, Nadine

From: Lewis, Sara J
Sent: January-08-10 2:21 PM
To: Templeman, Nadine
Subject: FW: Southern NL SEA

Follow Up Flag: Follow up
Flag Status: Completed

Hi Nadine,

I was wondering if you could provide me with a few references for the capelin comments of the SEA SSRP. Below are the comments made.

Thanks,
If you have any questions, please let me know.
Sara

Biological Environment, Non-Commercial Species, Capelin - Page 82 - While the SEA correctly states that no commercial fishery for Capelin occurs within the SNL SEA boundary, there are portions of two stocks of Capelin within its boundary that are fished commercially when they migrate into coastal waters to spawn. Specifically, the St. Pierre Bank or 3Ps stock is fished in Placentia Bay and the NAFO SA2+Div. 3KL stock is fished from St. Mary's Bay to White Bay. Therefore, referring to capelin as a non-commercial fish species as a whole could be considered inappropriate. A third stock, the Southeast Shoal or 3NO Capelin stock, spawns on the bottom on the Southeast Shoal. All three of these stocks spend a portion of their life cycle within the SNL SEA.

Capelin are often found along the coasts, especially during spawning season, and occur predominantly offshore while immature and maturing. However, capelin do not normally 'roll' on sand, but usually fine to coarse gravels are the preferred substrate. On beaches, capelin usually spawns at 5-8.5 °C but has been observed to spawn at 4-10 °C. On the bottom, spawning temperatures can be as low as 2 °C on the Southeast Shoal. Males and most females do not survive to spawn a second time. Additionally, spawning now goes into the month of August, and eggs that are produced are yellow, not red, as stated in the SEA. Once hatched, larval capelin, especially after they are in the bays and offshore in the fall are distributed deeper, rather than near the surface.

-----Original Message-----

From: Young, Elizabeth [mailto:EYoung@cnlopb.nl.ca]
Sent: Thursday, January 07, 2010 2:01 PM
To: Lewis, Sara J
Subject: Southern NL SEA

Sara,

I have had a request from LGL regarding DFO Comment D-49 (pg 15 of the Consolidated Review Comments - Draft 3). They are including the information provided on capelin but are wondering if there is a source/reference for it that they would put in the report.

Regards
Elizabeth

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Templeman, Nadine

From: Nakashima, Brian
Sent: January-12-10 11:18 AM
To: Templeman, Nadine
Cc: Lewis, Sara J
Subject: RE: Southern NL-Sea Capelin

Nadine,

I agree with what you have stated. If LGL was aware of Scott and Scott they certainly did not use it. If they had, I wouldn't have made the comments I did. I am fine with them putting in whatever they wish on capelin by paraphrasing aspects of what they feel would be pertinent in Scott and Scott. The other 2 references provide support for the comments I made on spawning temperatures and horizontal distribution of larvae that are more recent than Scott and Scott. This doesn't have to be in the report.

However way they wish to approach this, my only concern was that whatever was documented in the report would be close to what we know about capelin biology.

Hope this helps.

Brian

Brian Nakashima
Research Scientist / Chercheur Scientifique
Fisheries and Oceans Canada / Pêches et Océans Canada
Northwest Atlantic Fisheries Centre /
Centre des pêches de l'Atlantique Nord-Ouest
80 East White Hills Road
St. John's, NL A1C 5X1

s.19(1)

Tel/Tél: (709) 772-4925
Fax/Télécopieur: (709) 772-4188
Email/Courriel: brian.nakashima@dfo-mpo.gc.ca

From: Templeman, Nadine
Sent: Tuesday, January 12, 2010 11:04 AM
To: Lewis, Sara J
Cc: Nakashima, Brian
Subject: RE: Southern NL-Sea Capelin

Hi Sara,

please go through Brian. It is my thought that it doesn't matter that LGL is aware of Scott and Scott or not, but that they used/didn't use Scott and Scott (or other similar reference) in their original description of capelin (or that it was incorrect in some instances). If I recall correctly, the information provided in the review of the SNL SEA referred often to the basic biology of capelin (as it was not thoroughly covered in the SNL SEA document itself or was unclear) and so you wouldn't expect any cutting edge references for this material.

Maybe Brian can confirm/clarify.

Thanks!

N

From: Lewis, Sara J
Sent: Tue 12/01/2010 9:10 AM
To: Templeman, Nadine
Subject: FW: Southern NL-Sea Capelin

Nadine,
I wasn't sure if I should go to Brian or go through you. Elizabeth requires clarification.
Sara

-----Original Message-----

From: Young, Elizabeth [<mailto:EYoung@cnlopb.nl.ca>]
Sent: Tuesday, January 12, 2010 9:07 AM
To: Lewis, Sara J
Subject: RE: Southern NL-Sea Capelin

Thanks Sara

I have to ask - are these the references for the particular text that DFO provided or is this just general sources for information on capelin. I think that LGL are aware of Scott and Scott.

Regards
Elizabeth

-----Original Message-----

From: Lewis, Sara J [<mailto:Sara.Lewis@dfo-mpo.gc.ca>]
Sent: Tuesday, January 12, 2010 8:57 AM
To: Young, Elizabeth
Subject: FW: Southern NL-Sea Capelin

Elizabeth,
Here are a few references that Science came up with. I will advise if anything else comes across.
Sara

From: Templeman, Nadine
Sent: Monday, January 11, 2010 11:54 AM
To: Lewis, Sara J
Subject: FW: Southern NL-Sea Capelin

s.19(1)

Good morning Sara,
See below in response to your request from last week ~ I [REDACTED] will have periodic access to email if you have any questions ~
N.

From: Nakashima, Brian
Sent: Mon 11/01/2010 10:10 AM
To: Templeman, Nadine

Cc: Mowbray, Fran
Subject: Southern NL-Sea Capelin

Nadine,

In response to your request for references on capelin, here are a few to get them started...

Frank, K.T., J. E. Carscadden, and W. C. Leggett. 1993. Causes of spatio-temporal variation in the patchiness of larval fish distributions: differential mortality or behaviour? Fish. Oceanogr. 2:114-123.

Nakashima, B. S. and J. P. Wheeler. 2002. Capelin (*Mallotus villosus*) spawning behaviour in Newfoundland waters - the interaction between beach and demersal spawning. ICES J. Mar. Sci. 59:909-916.

Scott, W. B. and M. G. Scott. 1988. Atlantic Fishes of Canada. pp 145-150.

If you require more information, please contact me.

Brian

Brian Nakashima
Research Scientist / Chercheur Scientifique
Fisheries and Oceans Canada / Pêches et Océans Canada
Northwest Atlantic Fisheries Centre /
Centre des pêches de l'Atlantique Nord-Ouest
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